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REVIEW ARTICLES

(1) " The Present Position of Phenothiazine as an Anthelmintic ".

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A list of annotations and reviews, classified according to subject, is now given in *Index Veterinarius*, being inserted at the end of each number. Such papers will not necessarily be dealt with in the *Veterinary Bulletin*.

IMPERIAL BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 16.] March, 1946. [No. 3.

DISEASES CAUSED BY BACTERIA AND FUNGI

RAINEY, J. W. (1942.) **Running water in the prevention of bovine mastitis.**—*Aust. vet. J.* **18.** 250-251. **366**

R. suggests that mastitis can be controlled by the use of running water to clean the teats and udder of each cow before milking and the floor of the barn during milking.—J. D. STEEL.

*CELLA, F. (1942.) Di un caso di carpite tubercolare primitiva in un gatto. **[Primary tuberculous carpitis in a cat.]**—*Clin. vet., Milano.* **65.** 412-423. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 269-270.] **367**

C. describes a case in a cat of carpitis due to the human type tubercle bacillus.—E. COTCHIN.

*MONTEMAGNO, F. (1942.) Osservazioni sulla prova tuberculinica nel cane. **[The tuberculin test in dogs.]**—*Clin. vet., Milano.* **65.** 159–166. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 259.] **368**

A case report. A temperature reaction was recorded following the subcutaneous injection of tuberculin in a dog with a chronic suppurative process; g. pig inoculation, however, did not confirm the diagnosis of TB.—E. COTCHIN.

FOLEY, H., & PARROT, L. (1940.) Sur un essai de prémunition antituberculeuse collective par scarifications cutanées (méthode de S. R. Rosenthal). **[Tuberculous premunition by cutaneous scarifications.]**—*Arch. Inst. Pasteur Algér.* **18.** 275-278. **369**

The authors consider that the method used by ROSENTHAL in Algeria [see *V. B.* **9.** 820] gives satisfactory results; it is hoped it will be possible to apply the method on a large scale in Algeria.—J. A. G.

*GEISSLER, O. (1942.) Sippenforschung und Tuberkulose. **[Heredity and TB.]**—*Beitr. Klin. Tuberk.* **97.** 370–380. [Abst. from abst. in *Bull. Inst. Pasteur.* **41.** 279.] **370**

G. considers that hereditary predisposition has to be taken into account in studying the incidence of TB. Hereditary predisposition cannot be attributed to a single gene. Along with a disposition to TB. there must be at least two other hereditary factors, one influencing the specific receptivity of the individual and the other determining the manner in which the individual will react to infection.

A study of human families shows very marked differences in the number of persons affected in successive generations of the same family. In about 1860, when the incidence of TB. was at its peak, the number of people affected was greater than the number of people belonging to families with a history of TB., thus indicating that inherited susceptibility is not the only factor concerned in the epidemiology of the disease.

—H. I. FIELD.

CHARGAFF, E., & MOORE, D. H. (1944.) **On bacterial glycogen: the isolation from avian tubercle bacilli of a polyglucosan of very high particle weight.**—*J. biol. Chem.* **155.** 493–501. **371**

Glycogen preparations were obtained from avian tubercle bacilli by high-speed sedimentation of trichloracetic acid and borate buffer (pH 8·5) extracts. The high particle weight of 12·1 million was calculated from the sedimentation rate, diffusion constant and partial specific volume of the preparations. Hydrolysis of the polysaccharide yielded only *d*-glucose. None of the specific polysaccharides of the avian bacillus was found in the fractions examined.—A. B. PATERSON.

HOLLSTRÖM, E. (1943.) **An investigation into a yeast-like fungus isolated from patients suffering from, or suspected of, pulmonary tuberculosis.**—*Acta med. scand.* Suppl. No. 144. pp. 107. [In English.] **372**

Three strains of a yeast-like filamentous fungus (*Oidium* type) were isolated from gastric lavage specimens of tuberculous patients and two from the sputa. After cultivation for 12 months, single-cell cultures were established which ruled out the possibility that TB. was carried over with the fungus. After further cultivation, however, acid-fast organisms similar to Koch's bacilli were detected in three out of five strains.

The intravenous inoculation of rabbits with pure cultures produced abscesses, round-celled infiltration and granuloma in the internal organs, mainly in the kidneys. Most of the animals became cachectic and died. In one rabbit alone, lesions of a tuberculous nature were encountered and a pure culture of an acid-fast organism was isolated; in addition, acid-fast bacilli were seen in smears and sections from the organs of four out of 42 rabbits injected intravenously with glycerol-broth cultures of the fungus.

Rabbits and g. pigs inoculated with the original subcultures containing acid-fast bacilli failed to develop tuberculous lesions, but the culture isolated from the one rabbit produced limited tuberculous lesions in rabbits and g. pigs, although the latter failed to react to tuberculin. In respect of cultural characters and pathogenicity, this mutant differed from mammalian strains.—R. E. GLOVER.

*HUBER, F. (1941.) Das Vorkommen der Paratuberkulose des Rindes in Grossdeutschland. **[Johne's disease in "Greater Germany".]**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* Jan. 7th. 10. (1944).] **373**

The incidence of the disease is highest in East Prussia.—R. M. LOOSMORE.

KAPLAN, M. M., & LAGER, A. E. (1945.) **A clinical and laboratory study of spontaneous listerellosis in a goat.**—*Vet. Med.* **40.** 199–202. **374**

The authors give a comprehensive survey of the P.M. findings and clinical history of a case of listeriasis in a goat which lived 25 days after the onset of symptoms. Marked glycosuria and hyperglycaemia were followed by severe hypoglycaemia immediately prior to death. *Listeria monocytogenes* was recovered P.M. from the medulla, but cultures of cerebrospinal fluid taken before death were negative. Main lesions were perivascular cuffing throughout the brain, distended hepatic sinusoids, and petechiae in the horn cell area of the anterior cervical region.—G. B. S. HEATH.

URBAIN, A. (1942.) Au sujet de la pseudo-tuberculose chez le singe. [*Pasteurella pseudotuberculosis* **infection in primates.**]—*C. R. Soc. Biol. Paris.* **136.** 637–638. **375**

Few authentic reports of pseudotuberculosis in *Macacus rhesus* are to be found in the literature, but U. considers the condition to be relatively common. Between 1931 and 1942 he encountered 14 cases of the disease in various primates, including the chimpanzee (*Pan satyrus*), monkeys (*M. rhesus, M. sylvanus* and *M. irus*), the baboon (*Papio papio*) and *Cercopithecus aethiops*. All the animals were cachectic and on P.M. examination showed nodules varying from the size of a pin head to that of a hazel nut in the liver, spleen and sometimes lungs. Cultures from the lesions in all cases yielded *Past. pseudotuberculosis*. The strains isolated were pathogenic for g. pigs, rabbits and pigeons and caused lesions typical of pseudotuberculosis. U. considers that the infection is disseminated by rats.

—D. W. MENZIES.

*STEPHAN, J. (1942.) Über die serologischen Beziehungen verschiedener Stämme des Bacillus pseudotuberculosis rodentium Pfeifferei untereinander und zu verwandten Bakterien (Receptorenanalyse). [**The serological relationships of strains of** *Pasteurella pseudotuberculosis* **and related organisms.**]—*Abh. Med.-Chem. Forschstätten I.G. Farbenindustrie A.-G.* **4.** 465–477. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 281.] **376**

Serological tests were carried out with six strains of *Past. pseudotuberculosis*, three of which were obtained from horses, one from a rabbit, one from a turkey and one from a cow. The complement-fixation test was found to be applicable to horses and rabbits infected with this organism. The six strains could be divided into three groups by analysis of O and H antigens. One strain from a horse showed some serological relationship to certain salmonella strains, but none of the six strains showed any relationship with *Past. aviseptica* or *Past. pestis*.—E. COTCHIN.

LARSON, C. L. (1945.) **Isolation of** *Pasteurella tularensis* **from sputum. A report of successful isolations from three cases without respiratory symptoms.**—*Publ. Hlth Rep., Wash.* **60.** 1049–1053. [Author's conclusions copied *verbatim*.] **377**

P. tularensis was isolated from the sputum of three persons suffering from tularemia who manifested no frank clinical signs of pulmonary involvement. The inoculation of mice with sputum suspensions from patients suspected of having tularemia is recommended as a laboratory procedure. Microscopic examination of smeared preparations of infected mouse spleens, stained with Wayson's stain, offers a method of establishing an early tentative diagnosis of tularemia.

SCHOFIELD, F. W. (1945.) **Salmonella infections of the domestic animals. Their relationship to salmonellosis (food infection in man).**—*Canad. J. comp. Med.* **9.** 62–68. **378**

S. first gives the means of identifying salmonella and then points out the following important aspects of salmonella infections in animals, *viz*, the majority of infections are of the gastro-intestinal tract, young animals are attacked more frequently than old or mature ones, carriers are common, salmonella infections are more common in swine and poultry than in other animal species and finally, the organisms cause infection in a variety of animal species, few of the many types being limited to a single host. He next lists the types of salmonella causing widespread animal disease and considerable economic loss; these are *S. cholerae-suis*, which tends to be invasive both in animals and man, the *S. typhi-murium* group, isolated from all domestic animals and found more frequently than any other type, *S. pullorum*, causing widespread infection in chicks, *S. anatum*, a cause of heavy losses in ducklings and, unlike *S. pullorum*, reported to have caused food poisoning in man, *S. abortus-equi* causing contagious abortion in mares and also isolated from the joints of foals, and finally, *S. enteritidis, S. schottmülleri* and *S. dublin*, which are rarely found in the American continent. In a consideration of the types of salmonella infection in man, S. quotes the work of Bornstein who classifies such infections into salmonella fever, salmonella septicaemia and salmonella gastro-enteritis. Types of salmonella found in different foods are given as follows: in meat and meat products, *S. enteritidis, S. typhi-murium, S. derby* and *S. newport*; in milk and milk products, *S. enteritidis, S. cholerae-suis, S. dublin* and *S. typhi-murium*; in eggs and egg foods, *S. anatum, S. senftenberg, S. pullorum* and *S. typhi-murium*. As a means of preventing salmonella infection, S. suggests such measures as *ante-* and *post-mortem* food inspection with attention to rat and fly control, pasteurization and cooking, the periodical examination of the faeces of those engaged as cooks, etc., in public places and good refrigeration in slaughter houses, store houses and restaurants. In conclusion, attention is drawn to the very little work done on salmonella infections in such animals as the dog and cat, which frequently suffer from enteric disease and are close contacts for man.

—J. L. BYRNE.

ATKINSON, N. (1943.) **A new salmonella type:** *Salmonella adelaide*.—*Aust. J. exp. Biol. med. Sci.* **21.** 171–173. **379**

A new salmonella type derived from the faeces during life and from the liver and spleen P.M. in a fatal case of enteritis in a man is described and named. Examination of its O and H antigens and comparison with other types showed it to be a new type for which the antigenic formula XXXV: f.g. . . . is suggested.

—D. A. GILL.

GIBBONS, N. E., & MOORE, R. L. (1944.) **Dried whole egg powder. XI. Occurrence and distribution of** *Salmonella* **organisms in Canadian powder. XII. The effect of drying, storage, and cooking on the** *Salmonella* **content.**—*Canad. J. Res.* Sect. F. **22.** 48–57 & 58–63. **380**

XI. Three hundred and eighty samples of Canadian dried egg powder, produced between November, 1942, and December, 1943, were examined for the presence of salmonella organisms. Isolation was accomplished by placing the samples of powder in tetrathionate broth for enrichment and plating the resultant growth on SS Difco) agar. The organisms were identified on "sugars" and species were typed serologically. Salmonella were recovered from 28 samples and the following types were found in descending order of frequency: *S. bareilly, S. pullorum, S. oranienburg, S. typhi-murium, S. thompson, S. minnesota, S. newport, S. manhattan* and *S. potsdam*. A greater percentage of second-grade powder was contaminated

than of first grade and it was observed that in the latter, salmonella organisms were found more frequently in the warm months. The number of organisms per gramme was usually small: counts showed that of 21 samples, 13 contained less than one organism, seven contained 1–10 organisms and one sample contained 54 organisms per gramme. The distribution of salmonella organisms was irregular in two carloads which were examined.

XII. In liquid egg artificially inoculated with strains of *S. bareilly* and *S. manhattan* and then dried in an experimental spray drier, 99% of the organisms were killed. Since comparable results are obtained in experimental and commercial dryers with other organisms, and powders of similar quality are produced, it is deduced that most of the salmonella organisms would also be destroyed in commercial dryers. Storage of similarly infected egg powder at different temperatures revealed that the organisms survived longer at lower temperatures, but even at 7·2°C. there was 97% reduction in eight weeks and at −1·1°C. a 75% reduction in three months. In the cooking experiments, reconstituted powder contaminated with large numbers of three of the types of salmonella most commonly encountered was made up into omelettes, scrambled eggs, sponge cakes, custards and muffins. No organisms survived the cooking process. The authors refer to the possibility of the contaminated powder of the reconstituted egg being consumed raw, or in dishes not subjected to the same heat treatment as in the experiment.—J. L. B.

DARBY, C. W. (1944.) **Fowl cholera in Michigan.**—*M[ich.] S[t.] C[oll.] Vet.* **4.** 120–124 & 139. **381**

The first occurrence of fowl cholera since 1937 is described. The differential diagnosis of the disease, including the symptoms, P.M. lesions and bacteriology of the condition, is discussed at some length.—J. D. B.

NOBREGA, P., & BUENO, R. C. (1944.) Sôbre o reconhecimento de portadores na cólera aviária. **[On the detection of fowl cholera carriers.]**—*Arq. Inst. biol., S. Paulo.* **15.** 339–342. [Abst. from authors' English summary.] **382**

By the simultaneous inoculation of oral mucus of hens, known to be carriers of fowl cholera, into mice and pigeons it was possible to detect a higher percentage of carriers than by inoculating the mucus into either pigeons or mice alone.

Agglutination tests failed to reveal fowl cholera carriers.

GWATKIN, R., & MITCHELL, C. A. (1944.) **Transmission of *Salmonella pullorum* by flies.**—*Canad. J. publ. Hlth.* **35.** 281–285. **383**

A series of experiments was carried out to investigate this problem. In the first two experiments, chicks which had had access to feed contaminated by infected flies died of pullorum disease; here, however, the possibility of some chicks having eaten infected flies could not be excluded. In two later experiments, which were designed to eliminate this possibility, no chicks died of pullorum disease. In a fifth experiment, a small number of chicks died from eating chicken mash which had been exposed to infected flies; these flies were fed to another group of chicks from some of which *S. pullorum* was recovered. It was shown subsequently that the strain used to infect the chicks in the later experiments had lost virulence considerably and it is suggested that infected chick material might be a better infective agent than cultures in such experiments. *S. pullorum* was recovered from the feet and wings of flies immediately and up to six hours after exposure to bait; in the gut of such flies it was recovered up to five days, beyond which time cultures were not made.

—J. L. BYRNE.

NOBREGA, P., & BUENO, R. C. (1944.) Verificação de pulorose em uru (Odontophorus capueira). **[Pullorum disease in the "uru" (*Ondontophorus capueira*).]**—*Arq. Inst. biol., S. Paulo.* **15.** 37–38. [Authors' English summary slightly amended.] **384**

The authors describe two cases of pullorum disease in the uru (*Odontophorus capueira*), a wild gallinaceous bird of Southern Brazil, whose habits resemble very closely those of the domestic fowl. Both birds were caught in the State of Paraná and had no contact with other birds after they were put in captivity. They died a few days after being caught. Focal necroses were present in the spleen and there was a haemorrhagic enteritis. In both cases *Salmonella pullorum* was isolated from the liver and intestinal contents.

*PACCHIONI, G. (1942.) Sul comportamento di talune manifestazioni patologiche in animali affetti da infezioni associate sperimentali. Osservazioni sulla associazione Br. abortus e farcino criptococcico negli equini. **[Intercurrent brucellosis and epizootic lymphangitis in horses.]**—*Riv. milit. Med. vet., Roma.* **5.** 201–210. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 254–255.] **385**

A horse infected naturally with epizootic lymphangitis had marked and fatal exacerbation of the skin lesions following the subcutaneous injection of *Brucella abortus*. Another horse was first infected experimentally with *Br. abortus*, then with the cryptococcus; it was again injected with *Br. abortus* and in due course both the cryptococcal lesions and the local lesion at the site of injection of *Br. abortus* healed. Further experiments are in progress to determine the reasons for the differences in the course of the two infections in these two horses.—E. COTCHIN.

BUDDLE, M. B. (1944.) **Vaccination against contagious abortion.**—*N.Z. J. Agric.* **69.** 347–348. **386**

The results of the investigations on the efficiency of calfhood vaccination with strain 19 in the control of bovine contagious abortion conducted by the Department of Agriculture, New Zealand, since 1941 are summarized. In 1943, of 465 heifers vaccinated as calves, 4·7% aborted from various causes, while 32% of unvaccinated heifers aborted in these herds in 1942. 18,332 heifer calves in 1,160 infected herds were vaccinated in 1943 and 40,000 calves in 2,100 herds in 1944.—M. B. BUDDLE.

*RICKARD, C. G. (1945.) **The opsonocytophagic test in bovine brucellosis.**—*Thesis, Ithaca.* pp. 29. **387**

These studies were conducted in an attempt to evaluate the significance of the opsonic index as a measure of immunity in bovine brucellosis. Huddleson's technique, with modifications, was employed. Repeated tests were conducted in a herd of 23 animals, all of which had been under observation for a period of eight years. Twelve cows had been vaccinated as calves; 11 were left as controls. All animals had been continuously exposed to natural *Brucella abortus* infection.

R. concludes that opsonocytophagic activity is not a measure of immunity but indicates the presence of antibody in any amount above a certain low level. Cows known to be immune show wide variation in opsonic activity, depending on the amount of circulating antibody present in their blood plasma. In this study, using the standard agglutination test and Huddleson's technique for the opsonic test, animals with complete agglutination at dilutions of 1 : 16 and above showed marked phagocytic activity, while animals with aggln. titres at 1 : 8 and below showed very low or negative opsonic activities. This was true, regardless of the immune status of the animal. In these tests on the

bovine, where infected animals always carry a high aggln. titre (positive at a dilution of 1 : 100 or higher), all infected animals exhibited a high opsonic activity. The rise in circulating antibody which occurs in calves after vaccination with live strain 19 vaccine was observed as simultaneous increases in opsonic and aggln. activities. These observations favour the belief that opsonins and agglutinins in brucellosis are the same antibody, demonstrated in different ways. If this is true, there is little use for the opsonic test, since aggln. tests are much simpler and easier to conduct.—H. L. GILMAN.

I. BERNHEIMER, A. W. (1944.) **Parallelism in the lethal and hemolytic activity of the toxin of** *Clostridium septicum*.—*J. exp. Med.* **80.** 309–320. **388**

II. BERNHEIMER, A. W. (1944.) **Nutritional requirements and factors affecting the production of toxin of** *Clostridium septicum*.—*Ibid.* 321–331. **389**

III. BERNHEIMER, A. W. (1944.) **Kinetics of lysis by** *Clostridium septicum* **hemolysin**.—*Ibid.* 333–339. **390**

Culture filtrates of a single strain of *Cl. septicum* grown in a supplemented casein-hydrolysate medium were tested for their haemolytic and lethal activity. That a single antigen was responsible for both types of activity was suggested by the facts that throughout growth, the amount of lethal toxin present was proportional to the haemolysin, that when the culture filtrate was incubated at 37°C. and when it was treated with hydrogen peroxide, it suffered an equal loss in both lethal and haemolytic activity, that comparable values were obtained for antitoxins when they were assayed for their anti-haemolytic as well as their anti-lethal potency and that the haemolysin could not be separated from the lethal toxin by the use of adsorbents such as charcoal, kaolin and red blood corpuscles.

These results do not agree with those of some earlier workers and B. admits that the haemolysin produced under his experimental conditions may be different from that studied by others.

II. A relatively simple medium was evolved which, although free from protein and peptone, supported good growth and toxin production of several strains of *Cl. septicum*. To a 2% acid hydrolysate of casein were added the amino acids cystine and tryptophane and the growth accessory substances thiamine, pyridoxine, nicotinic acid, biotin and glutamine. The addition of iron up to a concentration of 500–1,000 μg. per litre increased growth in this medium, as did also glucose (0·7%). Toxin production was good and the potency was regularly 400–700 M.L.D. per ml. provided that the culture did not dissociate into non-toxic variants. The use of blood agar plates showed that only smooth haemolytic colonies were toxic. It was noted that serial subculture of *Cl. septicum* in the above medium was not advisable as this caused an undesirable increase in non-toxigenic variants. The addition of cooked meat to the medium caused a marked inactivation of toxin and haemolysin, probably because of its content of lipoid.

III. The haemolysin of a strain of *Cl. septicum* was studied and the type of reaction suggested enzymic activity because there was a linear relationship between the rate of lysis and the concentration of haemolysin. It is probably protein in nature as it is non-dialysable, thermolabile, precipitable by ammonium sulphate, and antigenic. The maximum rate of haemolysis occurred at or near 37°C. As the hydrogen-ion concentration increased from pH 9 to pH 5, the rate of haemolysis also increased, but no optimum pH level was found.—J. KEPPIE

PACCHIONI, G. (1942.) **[Intercurrent brucellosis an epizootic lymphangitis in horses.]** *See abst.* **385.**

KIMBALL, A., & FRANK, E. R. (1945.) **The isolatio of Actinomyces bovis from fistulous withers and po evil.**—*Amer. J. vet. Res.* **6.** 39–44. **39**

Material was examined bacteriologically from 5 unopened cases of fistulous withers and "poll evil (50 and five horses respectively). In some animal evidence of the disease had been present for only a fe weeks, while in others it had existed for some months in all the animals the lesions were typical in their si and clinical characters and none of them had bee treated in any way. From the cases of fistulous withe the material examined consisted of 20 or more curettin from the supraspinous processes affected by the disease In the "poll evil" cases the atlantal bursa was excise and scrapings from its lining were used for cultur studies. *Actinomyces bovis* was isolated from 40 of th 55 cases. The organisms were identified by the morphological, cultural and biochemical characters an all 40 strains were of the "smooth" type described b Rosebury. It is of interest that "sulphur granules were in no case detected in the lesions and it is suggeste that rosette formation may be associated only with th "rough" type.

Two strains of *A. bovis* from cervico-facial actino mycosis in man were also studied. One corresponde with the "smooth" type from horses, the other wa "rough" and differed from the smooth type in variou morphological, cultural and biochemical character In particular, it should be noted that only the "rough type is a distinctively branching, filamentous organism the smooth type occurs as pleomorphic, diphtheroi organisms composed of slender fusiform and filamentou elements, often taking in culture the form of sho rods. Typical club formation was not observed.

Whereas in 1941–42 only 60% of cases investigate yielded the organism, in 1944 the figure was 93%. Th more frequent recovery is attributed to improve cultural technique.—E. G. WHITE.

HINSHELWOOD, C. N. (1944.) **Bacterial growth.**— *Biol. Rev.* **19.** 150–163. **39**

An initial hypothesis is put forward that the variou regions of enzyme activity in a bacterial cell for macromolecular networks of specific pattern whic grow by polycondensation reactions. Intermedia substrates diffuse from one enzyme to another, so th the activity of the bacterium can at least in part b regarded as a sequence of chemical reactions linked bo temporally and spatially in definite relations.

In the light of this hypothesis, H. reviews th experimental data relating to the bacterial growth cycl cell division and cell morphology, the influence of dru on bacterial growth and the adaptation of bacteria t use new types of nutritive media or to resist drugs.—D. G. GILMOUR.

See also abstr. **481, 541, 544** (mastitis), **483, 500–503, 513–516, 544** (TB.), **478, 484** (fowl cholera), **517** (tularaemia), **493** (calf scours), **497, 49 505, 518, 519** (coliform organisms, salmonella), **541** (pullorum disease), **541, 544, 548** (bovine brucellosis), **420** (*Cl. welchii*), **476–478, 5 (bactericidal agents).**

DISEASES CAUSED BY PROTOZOAN PARASITES

KAZANSKIĬ, I. I. (1940.) Serodiagnostika "su-auru" loshadeĭ. **[Serodiagnosis of surra of horses.]**—*Trud. vsesoyuz. Inst. eksp. Vet.* **15.** 136–138. [French summary.] **393**

This is the first report on an investigation of th possible application of serological methods in th diagnosis of surra in the U.S.S.R.

In five cases of experimental infection, horse bloo

serum gave a positive Rieckenberg reaction, after the disappearance of trypanosomes from the peripheral blood.

Using *Trypanosoma equiperdum* antigen (with a slightly modified technique), K. applied the complement-fixation test to 776 horses in a field test for surra in Western Kazakhstan. In all, 27 positive (3·6%), 18 doubtful (2·4%), and 731 negative reactions were obtained. On farms where surra had previously been recognized, 12·1% of the animals tested reacted positively. No further details of the results are given.
—J. ALLAN CAMPBELL.

ITO, S., YAMASHITA, J., & NIWA, M. (1941.) **Studies on canine leishmaniasis in Manchukuo. I. The occurrence of canine leishmaniasis in Mukden.**—*Jap. J. vet. Sci.* **3.** 287–297. [In Japanese : English summary.] **394**

The authors record the finding of leishmania morphologically indistinguishable from *L. donovani* on P.M. examination of a dog. The dog, which had come from Mukden, showed no symptoms and was one of 200 old stray dogs examined with the object of ascertaining whether canine leishmaniasis was present in Manchukuo. The appearance of the parasite in culture and in the gut of insects [species not stated] is described.

The relationship of canine leishmaniasis to kala-azar is discussed. A systematic examination of old dogs showing skin lesions was being made. Sufficient evidence was not then available, but the authors believe that the dog may prove to be an important intermediary in the spread of kala-azar in Manchukuo.—E. R. P.

*LUCREZI, G., & LORIGA, G. (1940.) Reazioni sierologiche nella leishmaniosi canina. **[Serological diagnosis of canine leishmaniasis.]**—*Policlinico Sez. prat.* pp. 1500–1507. [Abst. from abst. in *Jber. Vet.-Med.* **68.** 219.] **395**

The authors used 210 dogs in an attempt to evaluate various serological methods of diagnosis. The tests used included the formol-gel, precipitation with pentavalent antimony (urea stilbamine), agglutination, precipitation of globulin on addition of distilled water, and the lactic acid gelification test. Twenty-two of the dogs gave positive reactions to one or several of the tests but none of the tests was considered specific, since parasites were not found in the spleens of some of the positively reacting dogs, while parasites were present in the spleens of some of the dogs which had given negative reactions.—E. R. PARISER.

*CARPANO, M. (1942.) Sulle due fasi endo- ed esoeritrocitarie del ciclo evolutivo della Theileria parva (Theiler, 1904) e del Plasmodium gallinaceum Brumpt, 1935, nell'ospite vertebrato. **[The endo- and exo-erythrocytic phases of *T. parva* and *P. gallinaceum* in the vertebrate host.]**—*Riv. Parassit.* **6.** 187–211. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 201.] **396**

T. parva and *P. gallinaceum* resemble each other in their cycles of development as both show a constant erythrocytic and a casual exo-erythrocytic development. The idea that erythrocytic haemosporidia can pass through part of their development in internal organs is not new, having been considered by Golgi in the case of *P. falciparum* infection. With many mammals, birds, and reptiles, C. could occasionally trace in organ smears various parasites which had no relation to parasites in the blood stream; forms resembling *Toxoplasma*, Gregarinidae, and *Leishmania*-like forms could be observed. Some of these forms found in liver and spleen smears are reproduced in the original article in eight photomicrographs.—C. HORTON SMITH.

—. (1943.) Impfung gegen die Piroplasmose (Hämoglobinurie) der Rinder. **[Inoculation for the control of bovine piroplasmosis.]**—*Tierärztl. Rdsch.* **49.** 111. **397**

Protective inoculation for bovine piroplasmosis is recommended in districts in which the disease occurs every year and in which more than 1% of cattle die or are slaughtered on account of the severity of the attack. Inoculation commences in March and is carried on till the middle of May. Threatened stock are immunized by systematic inoculation of calves and young stock, carried out for three successive years. After inoculation animals should be housed for at least 20 days. [The nature of the material used for immunization is not given.]—U. F. RICHARDSON.

*RIMPAU, W. (1943.) Über Leptospirose bei den Muriden (mäuseartigen Nagern). **[Leptospirosis in the Muridae.]**—*Zbl. Bakt. I.* (*Orig.*). **150.** 136–149. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 182.] **398**

Investigations have shown that the causal organism of human "mud fever" [*Leptospira grippo-typhosa*] occurs widely in Germany in Muridae. One species of *Leptospira* may infect many different kinds of mice and a particular mouse population may be infected with many different species of *Leptospira*. Cultural and serological research was undertaken in view of its value in epidemiology. The distribution of leptospirosis in Muridae is discussed in view of its bearing on regional medical problems.—U. F. RICHARDSON.

STILES, W. W. (1945.) **The recognition of leptospiral infections.**—*Bull. U.S. Army med. Dep.* **4.** 214–219. **399**

Attention is drawn to the increased recognition of human leptospiral infections : 77 cases were recorded in the British Isles before 1933 and 142 cases during the next four years. Cases may simulate yellow fever, malaria, blackwater, typhoid and typhus fevers, influenza and other infections and clinical symptoms cannot be relied on for diagnosis.

Laboratory diagnosis is discussed under the headings of g. pig inoculation, dark-field microscopic examination, culture, for which Schüffner's modification of Verwoort's medium is recommended, the agglutination test and animal protection tests. It is concluded that aggln. tests are quite reliable, the macroscopic method being more practical than the microscopic; cultural methods and dark-field microscopy are unreliable.—U. F. RICHARDSON.

DOYLE, W. L. (1943.) **The nutrition of the protozoa.**—*Biol. Rev.* **18.** 119–136. **400**

A critical analysis is made of the development of precise methods for evaluating the nutritional requirements of protozoa. Stages in the history of the subject involved successively the production of "species-pure", of bacteria-free, and finally of chemically defined cultures. The action of traces of some minerals and accessory food factors necessitates a high standard of purity of the chemicals used in the preparation of such media. Much work is shown to be invalid because of neglect of this precaution.

Systems of physiological classification of the Protozoa are discussed and the conclusion is reached that no comprehensive scheme can be applied to such a heterogeneous phylum.

Finally, work on the nutritional requirements of a few representative species, both free-living and parasitic, is considered in detail and it is shown that in most cases precise definition of the requirements has not yet been attained, for the reason that in work done hitherto the media used have been highly complex both chemically and physically.—D. G. GILMOUR.

See also abstr. **440, 520** (bovine trichomoniasis), **485** (antimalarial activity of tyrothricin), **506** (equine surra in India).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

ROLLINS, H. J. (1945.) **Rabies in cattle.**—*N. Amer. Vet.* **26.** 343–344. **401**

As a result of an outbreak of rabies in wild foxes in North Carolina, a number of cattle were bitten by rabid foxes. R. describes the clinical symptoms in cattle which developed rabies and gives an account of the results obtained by vaccination of cattle which had been bitten. In one herd eight cows and yearlings were bitten on the nose. These and 25 others which had not been bitten were vaccinated with four doses of vaccine at intervals of two days and none developed rabies. One death from rabies occurred in another herd of 54 cattle; the remaining 53 were vaccinated and all remained healthy. In a herd of nine Jersey cattle, one calf, eight months of age, developed rabies. During the course of its illness it had tried to suckle the cows, four of which had abrasions on the teats. The cows were vaccinated and none of them developed rabies. In a herd of seven cattle which were not vaccinated, four died of rabies during a period of 60 days. Details are given of the doses of vaccine used but its nature is not described.—M. C.

BRIDRÉ, J., & MARTIN, L. A. (1940.) Vaccination anticlaveleuse : vaccin sensibilisé obtenu par mélange titre virus + serum. **[Vaccination against sheep pox with sensitized virus.]**—*Arch. Inst. Pasteur Maroc.* **2.** 339–344. **402**

In the preparation of sensitized sheep-pox vaccine a fixed amount of virus is mixed with decreasing amounts of immune serum and inoculated intradermally into sheep in order to determine the minimum amount of serum which is required. The action of the serum is progressive, since suitable mixtures, inoculated between 5 min. and one hour after contact of serum with virus, produces well-marked lesions, but thereafter the reaction progressively diminishes and is practically non-existent after 24 hours.

This observation is held to support the theory of Burnet and Andrewes that virus particles exposed to antiviral serum are more readily phagocytosed than untreated particles.—R. E. GLOVER.

BEVERIDGE, W. I. B., BURNET, F. M., & WILLIAMS, S. E. (1944.) **The isolation of influenza A and B viruses by chick embryo inoculations.**—*Aust. J. exp. Biol. med. Sci.* **22.** 1–7. [Authors' summary copied *verbatim.*] **403**

During 1943 four strains of influenza virus A and one of influenza virus B were isolated by chick-embryo inoculation from sporadic cases of respiratory infection in Victorian military camps.

Yolk-sac inoculation of human material gave three primary isolations of influenza virus A but comparative experiments indicated that amniotic inoculation was a considerably more sensitive method.

All A strains were isolated in the O phase. On passage either by amniotic or yolk-sac methods mutation to the D phase occurred. Pure O phase virus could be maintained by passage at limiting dilutions.

Only one successful isolation of influenza B virus was made out of eleven throat washings from patients subsequently shown to have been infected with the virus. Possible reasons for these failures are discussed.

The potentialities of the embryo inoculation methods for the study of influenza virus in its natural (phase O) state are discussed.

MORGAN, I. M. (1945.) **Quantitative study of the neutralization of western equine encephalomyelitis virus by its antiserum and the effect of complement.**—*J. Immunol.* **50.** 359–371. **404**

The neutralizing capacity of immune sera against Western E.E. virus was measured by titration experiments in mice inoculated with suitable mixtures of serum and virus.

Heating serum to 56°C. resulted in a diminution in the antibody content of the undiluted serum, but this effect was reversible on dilution. With serum frozen at −76°C. the degree of neutralization increased after incubation of serum-virus mixtures at 37°C. for two hours, although the virus titre in normal serum controls was reduced. With serum stored at 4°C. this enhancing reaction was not observed.

It is suggested that a component, which may be complement, is lost at the higher temperature of storage, since the addition of g. pig serum restored the neutralizing capacity to its original level; on the other hand, the reduced activity of serum heated to 56°C. was not restored by complement. The antibody present in immune rabbit sera was confined to the pseudoglobulin fraction. Enhancement of the neutralizing capacity was also increased by complement.

—R. E. GLOVER.

CARNEIRO, V. (1944.) Comportamento do virus da encefalomielite infecciosa do cavalo por inoculação na membrana corioalantoide de embrião de mârreco. **[The behaviour of the virus of equine encephalomyelitis on the chorio-allantoic membrane of the duck embryo.]**—*Arq. Inst. biol., S. Paulo.* **15.** 331–338. [Author's English summary slightly amended.] **405**

In spite of the large number of papers published on virus culture in chick embryos, the embryos of other bird species have not been tested as to their suitability for this purpose.

In an experiment described, the behaviour of the virus of equine encephalomyelitis, Brazilian strain, was studied by inoculation of the chorio-allantois of the embryo of the duck (*Anas boschas*, variety Peking): the results were identical with those obtained with chick embryo. The virus cultures in duck embryo were regularly fatal for the g. pig up to the dilution 10^{-9}. A formolized vaccine of infected duck embryo in two doses, each of 0·5 ml., protected g. pigs against 1,000 lethal doses intracerebrally.

In one experiment with a goose embryo (*Anser cinereus*, variety Toulouse), the culture was fatal for the g. pig by the cerebral route, to dilutions 10^{-4} and 10^{-5}.

LAMARRE, L. (1944.) Formule leucocytaire dans l'anémie infectieuse du cheval. **[Leucocytic formula in equine infectious anaemia.]**—*Bull. Acad. vét. Fr.* **17.** 79–88. **406**

A large number of investigations were carried out with the object of establishing the leucocytic formula in E.I.A. The results appear to be conflicting, but there is a considerable degree of uniformity if the stage of the disease when the blood examination was made is taken into account. From a study of the literature, L. arrives at the following conclusions. In the period of intermission between the attacks, there is a neutropenia followed by mononucleosis. If the condition becomes chronic, the leucocytic formula tends to become normal. In the course of a febrile attack, eosinophiles decrease in number and may disappear, but they reappear during the period of intermission. The mononucleosis is due both to lymphocytosis and monocytosis, the monocytosis being recorded by large numbers of workers. In some cases abnormal types of leucocyte make their appearance, but this is not generally the case.

L. examined the blood of 20 horses and found that

during the period of a febrile attack neutropenia could generally be seen, as also during the period of intermission, but in cases of latent infections the leucocytic formula was normal. Eosinophiles disappear during the periods of attack, but reappear in the subsequent period of intermission. In three cases, a certain degree of eosinophilia was noted, which in one case was referable to strongyle infestation. In most of his cases L. noted a marked mononucleosis which was both lymphocytic and monocytic in origin. He discusses the phenomenon of mononucleosis in some detail and points out that it is not specific for differential diagnosis since it occurs in many other conditions.

L. states that a complete picture of the disease may be obtained by carrying out observations on temperature, erythrocyte sedimentation rate, red cell volume, number of erythrocytes, number of leucocytes and differential leucocyte count. In practice such a complete examination is not possible, but differential diagnosis may be made by sedimentation of the blood, from which sedimentation rate and red cell volume may be observed, by differential leucocyte count and by examination of the faeces for evidence of parasitic infestation.—T. E. GIBSON.

BELSCHNER, H. G. (1943.) **Swine fever outbreak in New South Wales.**—*Yearb. Inst. Insp. Stk N.S.W. 1943.* pp. 35–41. **407**

B. describes the outbreaks of swine fever in New South Wales during 1942–43. Of 49 outbreaks, 45 were in the County of Cumberland near Sydney, one was just outside the county boundaries, one was at Albury and two were at Hay. The disease was eradicated by slaughter. The origin of the disease in New South Wales was thought to be either infected pig meats received in Sydney from Western Australia (where the disease had broken out in November, 1942) or from American pig meats received in Sydney. The outbreak in Western Australia was probably due to introduced American pig meats.—H. McL. GORDON.

BUENO, P. (1944.) Estudos sôbre a peste suina. I.—O papel da associação microbiana. II. A reação do sistema reticulo-endotelial. [**Studies on swine fever. I. The role of associated bacteria. II. The reaction of the reticulo-endothelial system.**]—*Arq. Inst. biol., S. Paulo.* **15.** 81–86 & 87–96. [Absts. from author's English summaries.] **408**

I. Swine fever pneumonia is produced by the association of the virus with certain bacteria. There is no pure swine fever pneumonia, *i.e.*, no inflammatory process of the lungs caused exclusively by the virus.

The pathological picture caused by the virus without association of bacteria is represented by haemorrhages, tumefaction of the lymph nodes and the spleen (sometimes with infarcts), marked congestion of the liver and reddening of the bone marrow. All other inflammatory lesions (fibrinous, diphtheritic or necrotic) occurring in this disease result from secondary bacterial infections.

The intense reaction of the reticulo-endothelial cells observed in swine fever is consequent to the action of the virus, and bacteria of secondary infection do not interfere with this reaction.

II. Histological and bacteriological observations reveal that the intense participation of the reticulo-endothelial elements observed in the histological picture of swine fever is caused exclusively by the action of the virus and that the histological lesions encountered in pure swine fever (without bacterial association) are represented only by the reaction of the reticulo-endothelial system. This reaction occurs with particular intensity in the lymph nodes, the spleen and the liver and, more slightly, in the bone marrow and the adrenals.

The alterations observed in these organs have been studied in detail; the primary lesions are located in the reticulo-endothelium, while other lesions, such as haemorrhages and necrosis, are secondary manifestations of the disease.

DOYLE, T. M., & MCILROY, W. J. (1944.) **Crystal violet vaccine against swine fever. A field trial.**—*Vet. Rec.* **56.** 327–330. **409**

A series of large-scale field tests was carried out to compare the degree and duration of immunity conferred on the progeny of sows by crystal-violet vaccination both before and after weaning, to determine the degree and duration of immunity conferred by vaccination of pig herds both before and after weaning in commercial breeding and in herds which included store pigs purchased from outside as well as breeding stock, to determine the immunity conferred on pigs in swill-fed herds under poor conditions of hygiene and management, and to test the immunity of pigs vaccinated at the laboratory and subsequently exposed to infection on naturally infected farms.

The conditions of the trials and exposure to infection were designed to be as severe as possible; wartime difficulties in obtaining adequate supplies of suitable foodstuffs added to the severity. Full details of the numbers involved, mortality and sickness rates, nature of test infections and conditions of the various trials and controls are given and should be consulted in the original. The results are summarized in tables.

The safety of the vaccine was confirmed; 2,322 pigs of all ages were vaccinated without incident and there was no spread of infection from the vaccinated to 861 unvaccinated in-contact controls. Crystal-violet vaccine causes no systemic reaction and so can be used on unthrifty young pigs, but should such pigs later come in contact with virus a small mortality may occur as a result of recrudescence of latent bacterial infection. The unweaned progeny of vaccinated sows could be satisfactorily immunized. It appears that a longer immunity may be conferred by vaccination after weaning but the margin is not very great and the practical advantages of protection during approximately seven weeks of early life are considered to justify pre-weaning vaccination as a sound economic policy. It was shown that the immunity conferred by vaccination protected against artificial infection with highly virulent American strains of the virus and against exposure to contact infection with English field strains.

The fact that the vaccine has no curative action is emphasized; it is, however, of value as an insurance against introduction of infection into a clean herd. It should not be expected to give maximum protection when used on young pigs clinically affected with necrotic enteritis, anaemia, influenza or with dietary deficiencies.

The results of these trials justify the general use of the vaccine to reduce financial loss and as a valuable method of control.—M. C.

FORTNER, J. (1942.) Experimentelle Untersuchungen über die ansteckende Schweinelähme. [**Research on porcine encephalomyelitis (Teschin disease).**]—*Z. InfektKr. Haustiere.* **59.** 81–123. **410**

F. presents the results of a systematic investigation of porcine encephalomyelitis, extending data in his earlier paper [see *V.B.* **12.** 275].

In all, four strains of virus from the field have been passaged in young, newly weaned swine, two of them for 18 and 19 passages respectively. The most suitable route for experimental infection is the intranasal, practised on ether-anaesthetized animals. 1 ml. of inoculum was introduced to the olfactory region through a 12 cm. cannula inserted in the nostril.

The best source of virus is a brain and spinal cord suspension prepared from animals killed on the 1st or 2nd day of paralysis. In most cases a pooled suspension from three animals was used to overcome individual variation in virus content. By the intranasal route, 38 out of 47 normal swine were infected with strain "U" and 17 out of 21 with strain "S".

An attempt to infect those which did not develop symptoms, by a subsequent intranasal inoculation of virus, was unsuccessful in seven out of eight cases with strain "U" and two out of four cases with strain "S". F. concludes that these were "latent" cases and that this latent infection produced enough immunity for the animals to resist the second inoculation.

The incubation period after intranasal inoculation varied from 7–34 days with a mean of 13–14 days. Two swine inoculated subdurally became affected in seven days. The prodromal stage during which there is a febrile reaction up to 41·5°C., dullness, and inappetence, lasts 1–3 days before paralytic symptoms appear. The paralytic stage begins with unsteadiness of the gait; later the animals rise only with difficulty, and often become completely paralysed within 12 hours. Hoarseness and weakness of the voice due to paralysis of the vocal chords accompanies the general paralysis. Sensory function is unimpaired. With the onset of paralysis the temperature falls, often to below normal. In 150 affected swine, the course of the disease was as follows:– 91 died in the first week with complete paralysis; 10 died with complications (pneumonia, etc.) in the next two weeks; 23 were destroyed at 2–3 months as some degree of lameness and muscular atrophy was present; 26 completely recovered.

The P.M. findings in the acute stage were generally not indicative of the disease. Secondary lesions in paralysed swine often included inhalation pneumonia. In chronic cases the outstanding lesions were muscular atrophy and stiffening of the joints.

The histological findings described agree with those described by GRAU [*V. B.* **12.** 275] and MICHALKA [*V. B.* **12.** 411]. F. considers that these lesions are pathognomonic for Teschin disease and that diagnosis cannot be based on the clinical picture alone but must be supplemented by histological examination.

Attempts were made to infect one ape, three lambs, five dogs, three hens and numerous rabbits, g. pigs, rats and mice, without success.

The virus was preserved for 20 months at 0°C. in 50% glycerin. Dried on filter paper at 13°–16°C. it was infective after 23 days, but not at 54 days. In putrefying faeces it was inactivated in 21 days but not in six days. The stock brain and cord suspensions were infective at 1 : 1,000 but not at 1 : 10,000.

In disinfection, caustic soda was found to allow survival for four hours in a 3% solution. A 2% formalin solution inactivated the virus in one hour, and caporit (0·5% solution) and cresylic acid (2% solution) were effective in the same time.

The virus could not be detected in the nasal washings of swine at the 1st or 2nd day of paralysis. No direct evidence of the presence of virus in blood or urine was obtained. Faeces gave seven positive results in a series of 39 swine inoculated; of the swine which failed to react, 10 of 18 resisted a subsequent inoculation with virus. F. considers that this is evidence of latent infection by a small amount of virus in the faecal samples.

In one case infection followed feeding with infected brain and cord. In the susceptibility test of non-reactors 6 of 11 failed to react.

In contact experiments, of 21 healthy swine kept in close contact with diseased swine only three became infected. The eight unweaned piglets of an infected sow remained healthy. High rates of morbidity in outbreaks suggest enhanced virulence of some strains.

Immunity appears to last more than three months after an attack of the disease. Active immunization experiments with living virus were not encouraging. A formolized brain-cord suspension conferred some measure of immunity, only three of 17 animals so treated becoming infected by subsequent intranasal inoculation of virus, compared with seven of nine untreated controls. Attempts to confer passive immunity using swine serum were unsuccessful. A 2% zinc sulphate solution applied by means of a catheter to the upper nasal passages protected 11 of 12 swine which were inoculated with virus intranasally 13–14 days later. Vigantol [a Behring preparation of vitamin D], administered in two doses before infection, reduced the incidence of the disease from seven out of nine in the controls to six out of 15 in the treated animals.—J. B. BROOKSBY.

SCHLOTTHAUER, C. F. (1945.) **Some methods for the control of rabies and distemper among dogs.**—*Iowa Vet.* **16.** No. 4. 5–9 & 32. **411**

S. gives a general account of the clinical features and methods of control of rabies in dogs. Vaccination is considered to be a useful adjunct to other measures, such as control of stray dogs and dogs which have been exposed to risk.

S. describes his experience with distemper in dogs in a medical research institute and in general practice. He considers some breeds, such as Alsatians, bloodhounds and Labrador retrievers more highly susceptible than others. Serum, either from hyperimmune or from convalescent dogs, gave good results both in the treatment of early cases and as a prophylactic. Green's modified (ferret-adapted) vaccine has been used experimentally. Satisfactory protection was obtained by using doses of 15 mg. Smaller doses were ineffective and larger doses caused reactions. Vaccine in doses of 7·5 mg. was of no value in treatment of distemper. —M. C.

LEVINSON, S. O., MILZER, A., & LEWIN, P. (1945.) **Effect of fatigue, chilling and mechanical trauma on resistance to experimental poliomyelitis.**—*Amer. J. Hyg.* **42.** 204–213. [Authors' summary copied *verbatim.*] **412**

Monkeys subjected to exhausting exercise during the incubation period of experimental poliomyelitis developed a higher incidence and more severe paralysis than controls.

Monkeys subjected to chilling during the incubation period of experimental poliomyelitis also developed a higher incidence and more severe paralysis than controls.

Monkeys subjected to trauma of one or more limbs during the incubation period of experimental poliomyelitis showed no correlation with location of paralysis, and the severity or extent of paralysis did not differ from the controls.

The incidence and severity of paralysis was significantly greater in monkeys inoculated with poliomyelitis virus during the summer months.

I. BLAKE, F. G., MAXCY, K. F., SADUSK, J. F., Jr., KOHLS, G. M., & BELL, E. J. (1945.) **Studies on tsutsugamushi disease (scrub typhus, mite-borne typhus) in New Guinea and adjacent islands: epidemiology, clinical observations, and etiology in the Dobadura area.**—*Amer. J. Hyg.* **41.** 243–373. [Abst. from authors' summaries.] **413**

II. KOHLS, G. M., ARMBRUST, C. A., IRONS, E. N., & PHILIP, C. B. (1945.) **Studies on tsutsugamushi disease (scrub typhus, mite-borne typhus) in New Guinea and adjacent islands: further observations**

on epidemiology and etiology.—*Ibid.* 374–396. [Authors' summary copied *verbatim.*] **414**

I. Clinical, pathological, aetiological, epidemiological and entomological studies indicate that tsutsugamushi (literally "dangerous mite") disease is found not only in the river valleys of the islands of Honshu, Formosa and the Pescadores, but in many parts of S.E. Asia, the adjacent islands of the Indian Ocean and the S.W. Pacific, and the coastal areas of N. Queensland. The geographical distribution is indicated by a map.

Rickettsia orientalis has been incriminated as the aetiological agent, but the only species of mite which has been proved to be a vector by animal experiments is *Trombicula akamushi*. Other species of mite, including *T. deliensis* have also been suspected. In Japan, a principal host of *T. akamushi* is the field vole *Microtus montebelli*, a rodent found to be naturally infected with *R. orientalis*.

Nine strains of rickettsia have been isolated from patients with mite-borne typhus of New Guinea and cultivated in the yolk sac of fertile hens' eggs; two strains were also isolated from pooled mites (mostly *T. fletcheri*) collected in the Dobadura area of New Guinea. The reactions of both lots after inoculation into laboratory animals are described. Their morphological and pathogenic characteristics were similar to those described for *R. orientalis* and showed that both the human and mite strains were identical. This confirms the view that the mite-borne typhus of New Guinea is the same as tsutsugamushi disease in other areas.

II. Variation is discussed in ecological and epidemiological features of 5 different foci of tsutsugamushi disease in British and Dutch New Guinea and adjacent islands as affecting American troops. Institution of practical control measures is predicated upon consideration of these environmental factors combined with needs of local military operations.

Strains of the etiologic agent, *Rickettsia orientalis*, have been recovered by injection of white mice with suspensions of two species of trombiculid mites in two different foci. These mites were *Trombicula fletcheri* Womersley and Heaslip 1943 and *T. walchi* Womersley and Heaslip 1943 and are considered to be the vectors of importance locally. It was suggested that *T. walchi* may prove to be the same as *T. deliensis* Walch.

The principal hosts of these two species of mites were species of wild rats, including *Rattus concolor browni*, *R. mordax*, *R. praetor*(?), *R. gestri*(?), and *Melomys* sp., as well as the bandicoot, *Echymipera cockerelli*. Incidental to search for the vectors, about 35 species of larval mites were found on various mammalian, avian and reptilian hosts and in boot collections in the 5 areas studied. The recovery is also reported of *R. orientalis* from the brains of wild rats, *Rattus concolor browni*, a common species of the region.

Laboratory studies of these strains in white mice, white rats, guinea pigs and rabbits are reported, and their identity with human strains is shown as far as feasible in a field laboratory. *R. orientalis* has been demonstrated to persist in the brains of white rats for at least 98 days. Laboratory tests with 12 bandicoots, *Echymipera cockerelli* and *Isoodon torosus* from two sources, New Guinea and Australia, respectively, have not confirmed the reported susceptibility of this animal.

MEGAW, J. W. D. (1945.) **Scrub typhus as a war disease.**—*Brit. med. J.* July 28th. 109–112. **415**

Scrub typhus closely resembles other typhus fevers in aetiology, pathology, symptomatology and treatment. Scrub typhus and flea-borne and tick-borne typhus differ so sharply from classical louse-borne typhus in the epidemiological conditions in which they are transmitted to man that they must be placed in a separate sub-group. Scrub typhus, flea-borne typhus and tick-borne typhus are primarily diseases of the lower animals and infection is transmitted to man as a secondary incident; measures of control should therefore be directed against infected animals and the arthropod vectors which usually feed on them. Scrub typhus is more closely related to the tick-borne than to the flea-borne type, the animal reservoirs of which live in association with human communities, whereas the reservoirs of the other two diseases exist chiefly in rural and sylvan areas away from human settlements. M. considers that the term mite typhus is more suitable than scrub typhus. Scrub typhus is suspected of occurring occasionally in N.E. Africa but its certain range of distribution is confined to S.E. Asia, N. Australia, the islands adjoining these regions, and the Pacific Islands. There is a close association between the distribution of the disease and the areas in the East concerned with the military operations against Japan. The most dangerous areas are in S.E. Asia and the S.W. Pacific where the epidemiological conditions are particularly favourable for the existence of infection. Before the war in the East, scrub typhus was not of great importance except to labour forces in certain localities. Most of the affected areas were sparsely populated by indigenous peoples who were immune. Military operations introduced new conditions and when large bodies of troops entered infected areas, epidemics occurred. The fatality rate is about 1–20% while the average period of illness is three months.

The cause of scrub typhus is *Rickettsia tsutsugamushi* or *R. orientalis* which is closely related to other typhus rickettsiae in its morphological and cultural characters as well as in the pathological effects produced in the body. The vector of the organism is a microscopic larval trombiculid mite, *Trombicula akamushi*. *T. deliensis* and several other species are either believed or known to be capable of transmitting infection from animal to animal and from animal to man. The mite bites only once in its lifetime in the larval stage so that the same mite cannot both acquire and transmit infection. An infected mite can transmit infection through the egg to its offspring which can introduce the rickettsia into any animal or man on which it feeds. This peculiarity in the life-history of the mites has an important bearing on the methods of controlling the disease. The destruction of rats and other reservoirs of infection cannot have much immediate effect in stamping out infection and may indeed increase the risk to human beings by depriving the larvae of access to their usual hosts. The mites and animals from which they derive their infection are most plentiful in places where the ground is damp and covered with grass and other vegetation. The main method of prevention is the selection of dry camp sites cleared of grass and vegetation.—C. HORTON SMITH.

See also absts. **436** (infective agent of fowl paralysis), **473** (rabies diagnosis), **543** (balanitis of sheep), **544** (swine fever), **418, 419** (typhus).

IMMUNITY

JORDAN, J., & JONES, H. E. (1945.) **Typhoid fever in immunised personnel.** — *Lancet*, **249**. 333–335. [Authors' summary copied *verbatim.*] **416**

Forty-four cases of typhoid fever, part of an epidemic of 80 cases, were treated in a military hospital with 2 deaths. Despite the fact that all the patients had been immunised against the enteric group of fevers, the course of the disease was severe and unmodified.

*Jacini, G. (1942.) Chimica della sostanze attive delle tubercoline. **[The chemistry of the active principles of tuberculin.]**—*Saggiatore.* **3.** 42–46. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 280.] **417**

A review.—E. Cotchin.

Clavero, G., & Gallardo, F. P. (1943/44.) **Giroud's intradermic test in typhus fever infection. Personal observations, techniques, and possible applications.**—*Bull. Hlth Org. L.o.N.* **10.** 700–721. [Authors' conclusions copied *verbatim.*] **418**

The brain, tunica vaginalis, and blood of the guinea-pig, infected with classical or murine viruses, produce intradermic reactions that cannot be utilised for the study of sero-protection. Comparative study of infection with classical virus of various parts of the chick embryo has shown that it is the vitelline membrane that provokes the strongest reactions. Vitelline membranes used as reagents must be procured from embryos presenting an abundant development of rickettsiae—*i.e.*, live embryos. In general, the different strains act all in the same way—*i.e.*, provoke reactions which are similar. There are, nevertheless, some strains which show little local activity when inoculated in the skin.

Pathological examination of the intradermic lesions provoked by the infected vitelline membrane always showed—apart from the histological lesions described by Ruiz Castañeda and by Giroud—a leucocytic reaction predominantly eosinophil in character, of an intensity out of all proportion to the slight local eosinophilia produced by injection of normal vitelline membranes.

The most satisfactory technique for carrying out sero-protection tests is that of using pure serum to varied dilutions of rickettsiae. Sera of typhus convalescents always give protection, of greater or less intensity. Sero-protection persisted in the individuals studied for a period which exceeds 11 months. The sero-protection test is specific. Sera of healthy individuals and of individuals suffering or convalescent from diseases other than typhus do not reveal—at any rate in those cases we have studied—the slightest indication of protective power.

Felix, A. (1944.) **Technique and interpretation of the Weil-Felix test in typhus fever.**—*Trans. R. Soc. trop. Med. Hyg.* **37.** 321–341. **419**

F. summarizes existing knowledge on the Weil-Felix test in typhus fever. In patients suffering from louse-borne typhus there may be one or two types of agglutinin-formation curve to the OX19 strain of *Proteus.* One type is characterized by the early appearance of agglutinins and high maximum titres which persist after recovery. In the second type agglutinins appear late in the disease, do not reach high titres, and disappear early in convalescence. Cases of moderate severity have high titres, the most severe cases of uncomplicated typhus infections have very low titres and abortive or "inapparent" cases may have very high or very low titres. The effect of vaccination with rickettsial antigens and the presence of residual agglutinins after a previous attack of louse-borne typhus are discussed.

The technique of the agglutination test with OX19 is described. Particular stress is laid on the need for repeated tests with dilutions of serum as low as 1 : 25 and 1 : 50. The OX reactions in other typhus fevers are compared with the OX19 reaction as it occurs in louse-borne typhus.—D. L. Hughes.

Guillaumie, M., Kreguer, A., & Fabre, M. (1942.) Titrage des sérums anti-*perfringens.* **[Titration of *Clostridium welchii* antiserum.]**—*Ann. Inst. Pasteur.* **68.** 513–517. **420**

One strain of *Cl. welchii* (strain SS) in five liquid media was used to prepare toxin. The five strains of toxin after precipitation by ammonium sulphate were each titrated against five *Cl. welchii* antisera by intravenous injection of mice. Three of the sera were prepared from horses injected with the toxins elaborated by *Cl. welchii*, strain Lechien; the remaining two sera were prepared from horses injected with a broth culture of *Cl. welchii* strain SS. The number of units of antitoxin in each serum determined by titration against the five toxins was generally in agreement. In a few instances, however, the results varied up to 50%.

—D. W. Menzies.

—. (1945.) **Provision of snake anti-venom (serum antiviperin) for the treatment of snake-bite. A further note.**—*Mon. Bull. Min. Hlth Emerg. publ. Hlth Lab. Serv.* **4.** 201. **421**

A small supply of snake venom antiserum has been obtained from Algiers and is now available at a number of centres in Great Britain.

This serum has been prepared against the venom of the horned viper of Africa (*Cerastes cornutus*) but has protective action against the venom of *Vipera berus*, the common adder of Great Britain.

It may be obtained by medical officers of health and doctors from the sources which are listed.—M. C.

Tovey, G. H. (1945.) **A study of the protective factors in heterospecific blood group pregnancy and their role in the prevention of haemolytic disease of the newborn.**—*J. Path. Bact.* **57.** 295–305. [Author's summary and conclusions copied *verbatim.*] **422**

No one factor is wholly concerned in the protection of the foetal erythrocytes from the action of the maternal antibodies in a heterospecific blood group pregnancy, but probably different combinations of at least four main mechanisms operate, namely:—

(i) Lack of permeability of the human placenta to the anti-A and the anti-B agglutinins;

(ii) Neutralisation of incompatible anti-A or anti-B agglutinins crossing the placental barrier by group-specific substances in the foetal plasma;

(iii) Lack of sensitivity of the foetal erythrocytes towards the incompatible agglutinins; and

(iv) Diminished activity of the anti-A and the anti-B agglutinins at body temperature.

It is suggested that the important part played by the Rh agglutinogen and its corresponding agglutinin in the pathogenesis of haemolytic disease of the newborn is in part due to the freer passage of the anti-Rh agglutinins across the placenta, relative to the anti-A and the anti-B agglutinins.

It would appear that, in general, little can be done to enhance the natural protective mechanism in women known to be Rh negative. It is within our power, however, to avoid increasing the titre of the anti-Rh agglutinins in the mother's blood by ensuring that the antigenic Rh factor is not needlessly introduced into the circulation of any Rh-negative female who is either an actual or a potential child-bearer. Dacie and Mollison (1943) and Cappell (1944) have shown that it is possible to become sensitized to the Rh antigen by a single transfusion. Therefore from the cradle every female should be Rh typed, if circumstances permit, before receiving a blood transfusion.

See also abstr. **376** (serology of pasteurella strains), **387** (opsonins and agglutinins in brucellosis), **388-390** (toxin and haemolysin of *Cl. septicum*), **393** (serodiagnosis of equine surra), **402** (sensitized sheep-pox vaccine), **404** (complement and Western E.E. antiserum), **412** (effect of fatigue, chill, and trauma on virus resistance).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

PELOURO, J. T. (1943.) Significado das alterações anatomo-patológicas dos gânglios mesentéricos dos bovínos açorianos. **[Lesions of the mesenteric lymph nodes in cattle of the Azores.]**—*Repos. Lab. Pat. vet., Lisboa.* **5.** 223–226. [English, French and German summaries.] **423**

P. describes the lesions caused in the mesenteric lymph nodes by the larvae of *Linguatula serrata.*

—K. J. SINCLAIR.

DURANT, A. J. (1944.) **Demodectic mange of the milk goat.**—*Vet. Med.* **39.** 268–270. **424**

A clinical note advocating excision of nodules, cauterizing with 10% phenol and dressing with iodine.

—J. B. CRAGG.

DAVIS, L. J. (1945.) **Pulmonary acariasis in monkeys.**—*Brit. med. J.* April 7th. 482. **425**

In view of the possibility of mites being the causative agents of certain human pulmonary disorders in the tropics, D. draws attention to earlier observations on acariasis in monkeys. In *Macacus* sp., the presence of mites produced nodules in the lung resembling early tuberculous foci. When teased out such nodules showed the presence of mites, probably of the genus *Pneumonyssus.*—J. B. CRAGG.

See also abstr. **383** (fly transmission of pullorum disease), **486-491** (insecticides), **527, 543** (sheep blowfly), **544** (arthropod pests in New South Wales).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

BUGGE, G. (1944.) Der Muskelegel Dunckers beim Frosch. **[The muscle fluke of pigs in frogs.]**—*Z. Fleisch- u. Milchhyg.* **54.** 73–76. **426**

In areas where examination had revealed the presence of *Agamodistomum suis* in wild boars, plants and possible host animals were examined for intermediate stages of the trematodes. Stages of the fluke similar to those occurring in wild boars and badgers were found in grass frogs, but water frogs were uninfected. With the establishment of the frog as a natural host of the muscle fluke it will be possible to carry out further investigations into the details of the life-history.

—T. E. GIBSON.

BELLIAPPA, A. B. (1944.) **On a species of *Clinostomum* in a cat.**—*Indian vet. J.* **21.** 101–102. **427**

In one cat, 21 specimens of the trematode were found under the tongue, on either side of the frenum. The animal was eating poorly, champing its jaws, there was salivation, and the jaw movements were suggestive of a foreign body. In a second cat, 40 specimens were present on the sides of the frenum and of the mouth.

—H. D. SRIVASTAVA.

BARNETT, L. (1945.) **Hydatid incidence in New Zealand for the year 1943.**—*N.Z. med. J.* **44.** 99–109. **428**

B. states briefly the position in 1943 with regard to hydatids. The average incidence of infection in sheep and cattle was again 35%. In the Canterbury, Auckland and Dunedin districts a decreased incidence was observed.

It is suggested that, to ensure a speedy and successful control of the hydatid menace, compulsory regulations as to the dosing and feeding of dogs must be introduced and rigidly enforced, in place of the present campaign of prevention by education and persuasion.

—M. B. BUDDLE.

ANDREWS, J. S., & CONNELLY, J. W. (1945.) **Worm parasites in swine raised under a moderate degree of sanitation.**—*Proc. helminth. Soc. Wash.* **12.** 6–12. **429**

P.M. examinations were made on 129 pigs during the years 1941–43 to ascertain whether the system of management used at the Georgia Coastal Plain Experiment Station controlled the gastro-intestinal nematodes common in pigs in the region. The pigs were born in farrowing pens and then weaned on to temporary pastures. For details of the system of management the original article should be consulted. It was found that *Crassisoma urosublatum, Metastrongylus salmi, Hyostrongylus rubidus,* and *Stephanurus dentatus* were absent in the experimental pigs although they were present in farm-raised pigs in the region. The incidence of *Ascaris lumbricoides, Macracanthorhynchus hirudinaceus, Metastrongylus elongatus, Physocephalus sexalatus, Choerostrongylus pudendotectus, Oesophagostomum longicaudum,* and *O. brevicaudum* was lower in the experimental pigs than in farm-raised pigs from the same region, indicating some control of these species by the system of management adopted. *Ascarops strongylina, Strongyloides ransomi, Oesophagostomum dentatum,* and *Trichuris suis* occurred more frequently in the experimental pigs than in farm-raised pigs in the region. The system of management of the experimental pigs was evidently not effective in controlling these nematodes; the permanent farrowing pens providing particularly favourable conditions for their acquisition during the suckling period.—T. E. GIBSON.

I. SARWAR, M. M. (1944.) **Some new records of nematode worms from Indian ruminants.**—*Indian J. vet. Sci.* **14.** 60–61. **430**

II. SARWAR, M. M. (1945.) **Some observations on *Strongyloides papillosus* from Indian ruminants.**—*Indian vet. J.* **21.** 318–320. **431**

I. S. records the occurrence of *Paracooperia nodulosa, Cooperia punctata, Bunostomum phlebotomum* and a species of *Capillaria* from a buffalo calf and of *Oesophagostomum indicum* from sheep. A brief note is added to the original descriptions of *P. nodulosa* and *O. indicum.*

II. *S. papillosus* is recorded from sheep, goats and cattle in United Provinces. Three of fifteen infected calves and one heifer harboured rhabditiform larvae of the parasite. It has been observed experimentally that the direct type of life-cycle in this species is an adaptation to unfavourable conditions in the environment.

—M. AMIN.

PRISELKOV, A. M., & GUR'EVA, A. M. (1940.) Vliyanie nekotorykh dezinfitsiruyushchikh sredstv i temperatury na lichinki Dictyocaulus filaria. **[Action of certain disinfectants and of temperature on the larvae of *Dictyocaulus filaria.*]**—*Trud. vsesoyuz. Inst. eksp. Vet.* **15.** 171–172. [French summary.] **432**

When cold formalin solutions or creolin emulsions are applied *in vitro* to larvae of *Dictyocaulus filaria,* in cultures and washed from sheep faeces by a modification of the Baermann technique, the following are the times required before all the larvae are ultimately destroyed:—5% formalin—20 min., 3% formalin—30 min., 2% creolin—75 min., and 2% formalin—2 hours. Against larvae in faeces on the ground the cold preparations are ineffective. Hypochlorous acid (0·2% Cl_2) acts more rapidly on larval cultures and effects complete

destruction within 3 min., but 3–4 douchings of faeces on the ground do not ensure complete destruction of the contained larvae. Hot water (50° C. or over) rapidly kills larvae *in vitro*, but not in faeces. When heated to 50°C. or over, 3% formalin solutions and creolin emulsions are considerably activated, and under these conditions are completely effective against larvae in faeces in the field.—J. ALLAN CAMPBELL.

See also absts. **492, 543** (anthelmintics), **507** (*Onchocerca gibsoni* in Australian cattle).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

BERGNA, H. D. P. (1943.) Pseudo-tumor y tumores observados en las especies domésticas. **[Tumours in domestic animals.]**—*An. Fac. Med. vet., Univ. La Plata.* **6.** 63–90. **433**

B. discusses the embryology of the male and female sex organs and of the lymphatic vessels and nodes. He then describes in detail two cases of seminoma (for which he prefers the name of adult multicystic carcinoma), one case of lymphosarcoma in the dog and an osteosarcoma originating in the subperiosteal tissue of the humerus of a cat.—I. W. BROCKLEHURST.

*DUDZUS, G. (1943.) Die Geschwülste des Magens bei den Haussäugetieren. **[Neoplasms of the stomach in domestic mammals.]**—*Inaug. Diss., Berlin.* pp. 30. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 258.] **434**

A critical review of the literature showed 154 cases : 57 in the horse, 71 in the ox, 14 in the dog, 2 in the mule, 2 in the sheep, 2 in the pig, and 1 each in the rabbit, donkey, monkey, cat, deer, and hippopotamus. In 95 cases the tumour was a carcinoma, in 23 a sarcoma, in 12 a leiomyoma, in 8 an adenoma, in 7 a papilloma, in 7 a fibroma, in 1 a chondroma, and in 1 a lipoma.

—E. COTCHIN.

LÁSZLÓ, F. (1942.) Nebennierenkrebs bei Schweinen. **[Cancer of the adrenal glands in swine.]**—*Dtsch. tierärztl. Wschr.* **50.** 167–169. **435**

L. describes six cases of adenocarcinoma of the adrenal cortex in the pig. All the animals were 1–2 years old, only one adrenal was involved in each case and the tumours were usually situated at the anterior pole. Four of the tumours showed haemorrhages or telangiectases. The tumours were in all cases fairly well circumscribed.—E. G. WHITE.

ASPLIN, F. D. (1945.) **Fowl paralysis: the infectivity of fowl tissue suspensions to baby chicks.**—*Poult. Sci.* **24.** 379–381. **436**

A filtrable infective agent which produces characteristic pathological lesions in young chicks was isolated from fowls affected with neurolymphomatosis in England and reported by BLAKEMORE (1939), GLOVER (1940) and ASPLIN (1944). The absence of confirmation outside Britain gave rise to criticism, as although neurolymphomatosis was of world-wide occurrence the geographical distribution of the virus reported in England appeared to be limited. A. visited the Regional Poultry Research Laboratory at East Lansing, Michigan and examined affected fowls for a comparable agent. Four strains of virus were isolated from spontaneous cases of neurolymphomatosis. These strains have not yet been completely identified with those in England, but are considered to bear a close resemblance. The gross and microscopic lesions which these strains provoke in young chicks appear identical with those produced by the English strains.—W. R. K.

DISEASES, GENERAL

KAHNERT. (1943.) Zur Pferdeschaden - Statistik. **[Horse loss statistics.]**—*Tierärztl. Rdsch.* **49.** 35–36. **437**

For the purposes of insurance, losses in horses may be a result of death, emergency slaughter or permanent incapacity to work. Emergency slaughter includes the killing of an animal, either from humane reasons or otherwise ; such slaughter must be upon expert advice : economic grounds do not suffice. Permanent incapacity to work is accepted only on a veterinary certificate that the animal is useless for the type of work required of it and has no economic value ; such certificates may not be given until after two months' treatment and the expenditure on such treatment of a sum amounting to one-fifth of the insured value. Most animal insurance companies pay 80% of the total loss in cases of death and emergency slaughter and 50–60% in cases of permanent disability.

Of the 6,500 losses in horses dealt with by the horse life insurance department of the German rural service, 49·94% were losses from natural death, 27·46% were losses from emergency slaughter and 22·60% were losses from permanent incapacity to work.—S. M. G.

*ZANZUCCHI, A. (1942.) L'istaminemia nei cavalli normali ed affetti da enfisema polmonare alveolare cronico. Considerazioni eziopatogenetiche, dati sperimentali e ipotesi di lavoro. **[Histamine content of the blood of normal horses and those with chronic pulmonary emphysema.]**—*Nuovo Ercol.* **47.** 269–284.

[Abst. from abst. in *Jber. Vet.-Med.* **71.** 264.] **438**

The blood histamine content of 16 affected horses was almost double that of 25 normal horses, and approached the normal average value for cattle. The histamine level appeared to reflect the varying clinical condition.—E. COTCHIN.

MADDEN, F. J. (1943.) **A complaint of a puzzling nature affecting cattle in the Tamworth Pastures Protection Board District.**—*Yearb. Inst. Insp. Stk N.S.W., 1943.* pp. 27–28. **439**

The disease, which affects cattle of all ages and in all kinds of condition, is suggestive of an acute form of ephemeral fever (three-day sickness). Ephemeral fever first appeared in the district in 1937. The acute condition is seen usually from early summer to late autumn and the number of cases seems to be increasing each year. Symptoms are variable and mortality may be as much as 100%. The early symptoms include dullness, drooping ears, grinding of the teeth, rapid breathing, general stiffness and soreness of all limbs, disinclination to walk, high temperature, slight clear discharge from the nose, constipation, slight and continuous grunt, and evidence of general pain on handling. As the disease develops there is usually localization in one or more joints. In calves up to three months old the condition is usually fatal, but in older cattle it is of a chronic nature.

P.M. examinations usually show extensive peritonitis and slight inflammation of the mucosa of the

abomasum with small ulcers at the pyloric end. Petechial haemorrhages may be seen in various organs. —H. McL. Gordon.

Wright, J. G. (1945.) **Observations on the clinical aspects of reproductive disorders in cattle.**—*Vet. Rec.* **57.** 313–318. Discussion pp. 318–320. **440**

The view that endometritis is the chief cause of infertility now requires revision, especially since the recognition of *Trichomonas foetus* as a common invader of the reproductive tract. One of the commonest breeding irregularities is the absence of detectable signs of heat in non-pregnant animals. For this reason turning the bull out with the cows gives a higher fertility rate than hand service. A general account of infective diseases of the genital organs and of trichomoniasis is given.—J. A. Nicholson.

Vinattieri, E., Hayward, A. H. S., & Artioli, D. (1945.) **Retention of placenta in the buffalo, with associated sequelae.**—*Vet. Rec.* **57.** 509–511. **441**

Large numbers of buffaloes are kept for milk production in military dairy farms in India. In four such farms in the Lahore area the incidence of retention of the placenta was high (13·2–22·7%, with an average of 17·1% over 944 calvings). Retention of the placenta in the buffalo is a serious condition often followed by complications, such as prolapse of the vagina or uterus, infection of the genital tract, loss of milk, sterility, and in acute cases, death from toxaemia. The economic loss is high and at one farm alone it was estimated at Rs 3,850 a month.

The possibility that retention was due to *Brucella abortus* infection was denied by agglutination tests and examination of smears from the cotyledons. Stilboestrol (25 mg. given intramuscularly) was tried in two cases but abandoned as it was followed by severe straining and eversion of the uterus.

On account of the difficulty in getting buffaloes to "let down" their milk if they were accustomed to being sucked by their calves, it had been the practice to remove the calves at birth. The effect of allowing the calves to suck was tested by experiments on one farm. In the month of September the calves were allowed to suck, and out of 122 calvings there were six cases of retention with two deaths from metritis, as compared with 43 cases and 11 deaths out of 189 calvings in the previous month. The mortality in calves allowed to suck was 15% in male calves and 5% in female calves as compared with 50% in males and 35% in females which were not allowed to suck. Further trials were made to check these results. On one farm the calves born on the odd-numbered days were allowed to suck for three days while those born on the even-numbered days were removed at birth. The result showed that in 52 calvings where the calves were allowed to suck there were five cases of retention, while in 52 where the calves were removed, there were 13 cases.

Further similar tests confirmed these results and also showed that when the calves were allowed to suck the placenta was expelled more quickly after birth and that the milk yield of the cows was considerably greater as compared with those whose calves had been removed at birth.

The practice of allowing calves to suck for three days after birth has, as a result, been adopted as the routine practice in the military dairies in the Lahore areas; these dairies house 3,000 milking buffaloes. The incidence of retention of the placenta has been reduced by 75% and it is estimated that there is a monthly saving of Rs 10,000.

In discussing the results the opinion is expressed that suckling stimulates contraction and involution of the uterus and that milking twice daily either by hand or milking machine is a poor substitute for physiological massage by the suckling calf.—M. C.

Kingsbury, B. F. (1945.) **Lymphatic tissue and regressive structure, with particular reference to degeneration of glands.**—*Amer. J. Anat.* **77.** 159–187. [Author's summary copied *verbatim*.] **442**

The examination in the cat of a large number of minor glands of the root of the tongue, soft palate, larynx and laryngo-pharynx revealed the frequent presence of lymphatic tissue particularly in certain groups of these glands.

The lymphatic tissue was diffuse, dense-diffuse, in masses or nodules. In general it was atypical.

Nodules were small and usually atypical, with or without "clear areas". Clear areas are seemingly the equivalent of germinal centers of typical nodules.

The lymphatic tissue was usually intimately associated with gland body or, frequently, with the duct of the gland.

The cells of the lymphatic tissue are lymphocytoid cells (small lymphocytes), blastic cells and large blastic cells. Polymorphonuclear cells also were present.

The cell types in question were interpreted as of local formation.

The glands involved were usually degenerative, sometimes markedly so.

Mononuclear and polymorphonuclear cells occur frequently in the lumina of glands and/or ducts.

While no attempt was made to determine the cause of either the degeneration of glands or the association of lymphatic tissue therewith, the probability of infection is considered and the possible interpretation as a form of inflammatory reaction is discussed.

The source of the polymorphic nuclei is considered and they are compared with those of the polymorphonuclear leucocytes of the blood.

Comparison is made of the lymphatic tissue in question with the definitive lymphatic tissue of accepted status and also with lymphatic tissue within glands in pathologic cases.

Hurst, E. W., & Cooke, B. T. (1943.) **Capillary fat-embolism in the brains of sheep, pigs and monkeys, with especial reference to demyelination and other lesions in the white matter.**—*Aust. J. exp. Biol. med. Sci.* **21.** 141–148. [Authors' summary copied *verbatim*.] **443**

Introduced into the cerebral circulation of sheep, pigs and monkeys, globules of olive oil in the form of a mayonnaise may block many of the cerebral capillaries without causing damage to the parenchyma. In many animals, however, lesions develop in some areas where (1) many closely adjacent capillaries are blocked by small globules of fat, (2) an unusually large globule lodges, and (3) the capillaries and rather larger vessels become obstructed by peculiar hyaline plugs. These plugs are not ordinary thrombi; apparently they disappear within a very few days. The obstructing globules of fat also disappear progressively, so that examination of a brain in any but the earliest stages does not give a true idea of the number of vessels initially blocked. Lesions in the white matter of the brain are more numerous and/or more severe than those in the grey; the former range from areas in which there is damage to only a few myelin sheaths and axons to those in which full necrosis of tissue has occurred. Their distribution is similar to that of the areas of demyelination or necrosis in poisoning with KCN. These findings are discussed briefly in relation to recent observations on fat-embolism and on disseminated sclerosis and disseminated encephalomyelitis in man.

No evidence was obtained that haemolysins, neurotoxic antibodies or precipitins could be carried to the nervous system on the obstructing globules, at any rate in effective concentrations.

WOLKIN, J., GOODMAN, J. I., & KELLEY, W. E. (1944.) **Failure of the sweat mechanism in the desert. Thermogenic anhidrosis.**—*J. Amer. med. Ass.* **124.** 478–482. **444**

The authors describe a syndrome involving failure of the normal sweat mechanism in a group of soldiers exposed to extreme heat. The most striking feature in the cases examined was the profuse outpouring of sweat which lasted from a few days to several weeks and was followed by complete cessation of sweating in the body region below the neck. The skin of this region had the appearance of gooseflesh and in cases of long standing there was fine desquamation.

The authors found that the degree of sweating reached its maximum when the body was exposed to the desert sun at temperatures exceeding 120°F. The hypodermic injection of 0·016 g. pilocarpine and the injection of 25 mg. mecholyl both produced almost complete anhidrosis below the neck and hyperhidrosis above. After recovery of the sweating function, symptoms could not again be provoked. Salt therapy did not affect the condition but removal from excessive heat allayed symptoms.—S. M. G.

SIMONDS, J. P., & HEPLER, O. E. (1945.) **Experimental nephropathies. I. A method of producing controlled selective injury of renal units by means of chemical agents.**—*Arch. Path.* **39.** 103–108. **445**

The authors have adduced further evidence in support of the view that selective injury of various parts of the nephron in the dog can be produced by intravenous injection of certain chemicals. Potassium dichromate causes necrosis of the first part and mercury bichloride [$HgCl_2$] and uranyl nitrate cause necrosis of the terminal part of the proximal convoluted tubule. These tubular poisons increase the tendency of the tubular epithelium affected to accumulate fat, and this assists identification of the particular portion of tubule damaged. It is important to use suitably small doses to obtain effects limited to certain parts of the tubule; still smaller doses produce effects which are less severe than necrosis and might be employed in studying disturbances of function of limited parts of the nephron; the authors have already carried out some work on these lines which is to be published later [see following abst.].

—E. G. WHITE.

HEPLER, O. E., GURLEY, H., & SIMONDS, J. P. (1945.) **Experimental nephropathies. II. Renal phosphatase after poisoning with mercury bichloride, uranyl nitrate and potassium dichromate.**—*Ibid.* 133–141. [Authors' summary copied *verbatim*.] [For part I, see preceding abst.] **446**

All the experiments reported in this paper were made on dogs and the conclusions apply only to that species.

Changes above and below the normal mean occurred in the alkaline phosphatase of the blood serum within a period of eight days after poisoning with mercury bichloride. Doses of potassium dichromate and mercury bichloride that caused extensive necrosis of the epithelium of the renal tubules reduced the phosphatase activity of the kidneys. Uranyl nitrate in doses up to 3 mg. to 100 c.c. of blood caused marked necrosis of the tubular epithelium but did not reduce the phosphatase activity of the kidneys as determined by chemical methods; in many animals the poison appeared to increase it. Subnecrotizing doses of all three of the afore-mentioned chemical agents increased the activity of phosphatase in the kidneys, as determined by chemical methods.

The earliest morphologic change in the phosphatase in the epithelium of the proximal convoluted tubules induced by the heavy metal poisons used in these experiments was diffusion of the enzyme throughout the cytoplasm from its normal location in the brush border. Active phosphatase can still be demonstrated by histochemical methods (Gomori's stain) in the debris of disintegrated necrotic cells of the proximal convoluted tubules.

The function of alkaline renal phosphatase is unknown. If it has a function, it would seem that this must be related to its limitation to the brush border of the epithelium of the proximal convoluted tubules and that it is concerned with absorption of some substance or substances from the contents of the lumen rather than the excretion of products into the lumen. Reasons are presented for the possibility that alkaline renal phosphatase may not have any functional significance. Its presence in the brush border of the epithelium of the proximal convoluted tubules may be due only to an attempt by the cells to absorb it, the attempt being unsuccessful because its molecule is too large to be transported by the cells from the lumen to the peritubular tissue spaces.

MEAD, S. W., GREGORY, P. W., & REGAN, W. M. (1943.) **Hereditary congenital flexed pasterns in Jersey cattle.**—*J. Hered.* **34.** 367–372. **447**

This article describes a condition involving primarily a flexion of the pastern joints, which was manifested in 17 calves of the inbred Jersey herd of the University of California; it is the fifth in a series of hereditary defects which have been segregated within this herd. The abnormality, which was easily recognizable at birth, persisted for a few days or weeks, but gradually disappeared. The expression of the defect varied. It was more often present in the fore legs alone, though it infrequently affected the hind legs to a lesser degree. In the more severe cases, the toes of the fore feet were completely turned under. In the milder cases, the pastern joints were flexed, but the feet were not completely turned under. Calves exhibiting the condition were as vigorous as normal sibs. Since, however, the severely affected calves cannot suck without aid, this defect would act as a semi-lethal unless help were available. A study of the inheritance suggests that there may be two types of flexed pasterns. The principal one is conditioned by a single autosomal recessive gene; the other is a non-hereditary type, phenotypically indistinguishable but having an incidence of about 2%.

—N. J. SCORGIE.

See also absts. **494** (atonic indigestion in cows), **506** (livestock diseases in India and Burma), **507, 543, 544** (in Australia), **510, 511** (in the U.S.S.R.), **512** (in Angola), **541** (in Ontario, Canada), **545** (in New Zealand), **547** (in Jamaica).

NUTRITIONAL AND METABOLIC DISORDERS

GOSS, H. (1943.) **The proper use of protein during the present protein shortage.**—*J. Amer. vet. med. Ass.* **103.** 108–109. **448**

The effect of protein shortage in America due to war conditions is discussed.

It was found that the proteins of soya beans, cottonseed and peanuts even when compared with animal proteins had a high biological value for growth, when used as the sole source of protein in the diet.

G. recommends the growing of more vegetable

protein foods and supplementing them with the minimum amounts of protein concentrates to meet the demands for rapid growth, full production and reproduction.—E. M. J.

—. (1943.) **Supplying phosphorus to farm animals.**—*J. Amer. vet. med. Ass.* **103.** 109–110. **449**

On account of the shortage of phosphorus the Committee on Animal Nutrition of the New York State Emergency Food Commission make the following recommendations. With dairy cattle it is not necessary to add a phosphorus supplement, as the usual type of grain mixture has a fairly good phosphorus content. The addition of 1% of ground limestone to dairy feeds is advisable. If a safe phosphorus supplement is available, the equivalent of 1% of steamed bone meal can be added to calf meals or calf starters and to special mixtures for young stock.

1% of raw rock phosphate may be used in chick rations without harmful effects. The amount of steamed bone meal and calcium phosphate being added to chick rations varied from 1–1·5%, and the amount added to mash mixtures for growing stock and laying hens varied from 2–3%. The use of larger amounts of vitamin D greatly increased the utilization of phosphorus.

With horses, beef cattle and sheep, phosphorus supplements are not generally needed if hay land and pastures are fertilized with phosphate.

With pigs, a well balanced ration supplying sufficient protein gerferally contains the minimum phosphorus requirements.—E. M. J.

—. (1944.) **The use of phosphorus-containing substitutes for bone meal in livestock feeding, with particular reference to the fluorine hazard.**—*J. Amer. vet. med. Ass.* **105.** 95–98. **450**

America has been faced with a war-time shortage of bone as a source of phosphorus. As a result, rock phosphate (containing up to 3·5% fluorine) has been used in rations. High-protein foods usually supply an adequate amount of P but a supplement is required for some store cattle. The minimum needs of P for various stock along with the maximum permissible F (0·003% of dry matter for mammals and 0·015% for poultry) are discussed in the light of the recommendations of the Committee on Animal Nutrition of the New York State Emergency Food Commission [see preceding abst.]—W. H. Parker.

Krupski, A., Uehlinger, E., Almasy, F., & Ulrich, H. (1943.) Weitere Osteoporose-Fälle bei Jungtieren der Fleckviehrasse. XIV. Mitteilung. **[Osteoporosis in the young stock of Swiss spotted cattle. XIV.]**—*Schweiz. Arch. Tierheilk.* **85.** 65–75. [For part XIII, see *V. B.* **16.** 19.] **451**

Krupski, A., Jung, A., Almasy, F., Hail, G., & Ulrich, H. (1944.) Untersuchungen über den Ca-, Mg-, P-Stoffwechsel und klinische Beobachtungen bei einem leckssüchtigen Jungrind der Fleckviehrasse. XV. Mitteilung. **[Researches on the Ca, Mg, and P metabolism and observations on a calf with pica. XV.]**—*Ibid.* **86.** 144-161. **452**

XIV. The authors investigated cases of osteoporosis among young cattle in a herd near Zurich. Two animals about 22 months old were kept under observation for six and a half months and then slaughtered. The bones of both animals showed osteoporosis although the serum-Ca values during life were only very slightly below normal. Serum-P was normal in one animal and at times somewhat high in the other; in the latter animal serum phosphatase was very high. Ca, P and Mg intake and excretion were studied over a seven-day period in both animals. Plasma pH and total plasma CO_2 were within the normal range in both animals.

The osteoporosis is attributed to feeding exclusively on hay from the time when the animals were weaned.

XV. The authors give a detailed account of the Ca, P and Mg metabolism of a calf affected with pica. The animal came from an area in which deficiency diseases are common among young stock. The bones showed osteoporosis, the condition developing after weaning. The symptoms were loss of appetite, pica, loss of condition, rough coat and nervousness. The symptoms disappeared when milk was fed but rapidly reappeared when a diet consisting entirely of hay was fed. Skimmed milk was as effective as whole milk. The authors consider that milk protein is possibly a curative agent and propose to determine whether the administration of a combination of milk protein and vitamin D brings about more rapid improvement than the vitamin alone.—E. G. White.

Squibb, R. L. (1945.) **Big head of horses in El Salvador.**—*J. Amer. vet. med. Ass.* **107.** 84–89. **453**

S. describes "big head" of horses as it occurs in El Salvador; the symptoms, lesions and photographs of cases show that he is dealing with osteofibrosis. In El Salvador, October to May is very dry with strong winds causing pastures to dry up completely; during this season cases occur in horses fed concentrates and allowed access to the burned-up pastures.

Details are given of the diet at one stable where 25% of the horses showed symptoms. [The Ca and P content of the diet is not mentioned, but as it contained a high proportion of such foods as wheat bran, rice bran and rice polishings, it is likely that the ratio of Ca : P was wide.]

In April, 1943, this diet was altered by increasing the proportions of maize, cottonseed meal and cottonseed husks, by the addition of a mixture of ground oyster shell and bone meal and by giving 15 ml. of a locally prepared shark liver oil per day to each horse. This shark liver oil contained 1,500 I.U. per g. of vitamin A; the affected horses then improved and by the end of June all cases had been arrested. S. attributes this to the shark liver oil, ignoring the improvement in the Ca : P ratio which must have resulted from the alterations in the diet and the growth of pasture occurring with the onset of the rains in May. Before alterations were made in the diet, the horses were tested for night blindness but none of them showed this symptom of vitamin A deficiency.

[The conclusion that the cases were cured by the shark liver oil seems to rest on insufficient evidence. The view generally accepted is that osteofibrosis in horses is caused by a low calcium content in the diet or an imbalance between the calcium and the phosphorus; S. has not shown that this factor was absent in his cases.]—M. C.

—. (1941.) Voprosy vitaminnovo pitaniya zhivotnykh na plenume vsesoyuznovo vitaminnovo komiteta. **[Discussion of the use of vitamins in animal feeding held at the plenary session of the All-Union Vitamin Committee.]**—*Veterinariya, Moscow.* No. 1. pp. 132–133. **454**

The meeting, held in December, 1940, dealt with the achievements in 1940 and planning for 1941. The All-Union Institutes for Animal Husbandry, Nutrition, and Experimental Veterinary Medicine, the Moscow Veterinary Institute, and Pushkin's Zootechnical Laboratory were represented.

Among the papers presented was a report by Nesterova on the correct vitamin feeding on collective farms. The carotene norm for dairy cows is calculated as 0·25–0·3 mg. per kg. body weight and 6–12 mg. per

litre of milk yielded. Vitamin D should be given to dry cows at the level of 30 I.U. per kg. body weight per day. The carotene assimilation of pigs was discussed.

POPANDOPULO reported on the best methods of preservation of carotene in hay and on the influence of vitamins A and E on reproduction. The feeding of wheat germ to bulls gave good results.

ZUBRILIN reported on the influence of drying and ensilaging on the carotene content of feeding stuffs.

KOBYZEV dealt with the carotene content of hay prepared by different methods. He stated that there was a 50% loss of ascorbic acid in milk kept for 24 hours.

SOLUN reported the beneficial results obtained following adequate vitamin administration to sheep in the Southern Ukraine; this resulted in a decrease in infertility from 18% to 4%, an increase of lambs per 100 ewes from 85 to 119, and a wool increase of a kg. in ewes. There was a lower incidence of disease. Chicks 14–40 days old require 400 units and those 40–65 days old 800 units of vitamin D. Weanling piglets should receive 30 units vitamin D per kg. body weight.

ALIKAEV observed that calves born of cows which received a mineral supplement and vitamins A and D during the dry period developed better and were more resistant to disease. The addition of vitamins A and D to the food of pregnant mares resulted in an increased resistance towards artificial infection with *Salmonella abortus-equi*. Experiments were in progress on the influence of vitamins A, B, and D on the resistance of foals to equine infectious anaemia.

Various groups of workers were chosen for research for the following year.—A. MOLDAWSKY.

VUILLAUME, R. (1943.) Etat actuel de nos connaissances sur les vitamines du groupe B. **[Current knowledge of the vitamin B complex.]**—*Rec. Méd. vét.* **119.** 177–184. **455**

After a brief review of the nature of the vitamin B complex, an account is given of the chemistry of vitamin B_1 and its biological significance.—A. M. COPPING.

RICHARDS, M. B. (1945.) **Imbalance of vitamin B factors. Pyridoxine deficiency caused by additions of aneurin and chalk.**—*Brit. med. J.* March 31st. 433–436. **456**

Rats were maintained from weaning to maturity on a basal diet planned to approximate in caloric value and Ca content to a poor human diet, consisting of 1,020 g. white flour, 400 g. commercial casein, 32 g. dried brewer's yeast, 33·3 g. salt mixture, 180 g. margarine, vitamins A, D and E as radiostoleum with added tocopherol, KI, $MnSO_4$ and a small amount of vitamin B_1. Two other groups of rats received the same diet with an addition of vitamin B_1 equivalent to the difference in the vitamin B_1 content of white and national flour, or with 10 times this amount. Half the rats in these three groups received an addition of chalk in the amount recommended for addition to fortified white flour.

The growth of the rats on the various diets was not very different but those having the high vitamin B_1 diet showed the smallest weight gains. On all levels of vitamin B_1 intake, addition of Ca to the diet resulted in increased gain in weight. The rats were mated at 115 days of age and litters were obtained in all the groups. During lactation, supplements of 10 or 20 ml. milk were given daily. Rats on the unsupplemented basal diet reared their young successfully and no abnormalities were observed among the litters. In the rats with high vitamin B_1 diets, the addition of 10 ml. milk was inadequate to permit normal lactation and there were many deaths in the litters; in the sub-group with extra Ca and high vitamin B_1, none survived in 5 of the 11 litters and most of the surviving young in the other litters were in poor condition. When 20 ml. milk was given, lactation was more satisfactory but the young were below normal weight and many had fits which appeared to be similar to those described by other observers as occurring in rats deprived of vitamin B_6. The puny and sickly young rats rarely had these convulsive seizures. In the rats having the medium addition of vitamin B_1, the lactation performance was between that of the high and low vitamin B_1 groups and only a very few young rats had fits.

A further breeding experiment was carried out in which seven females having the high vitamin B_1 diet were given a supplement of 400 μg. vitamin B_6 daily from the time of parturition and reared normal litters, while in a control group with no added vitamin B_6 the characteristic fits were observed in the young. In this second experiment the results did not correspond in every particular with those of the first test, but this was attributed to unavoidable differences in some of the ingredients of the basal diet.

The vitamin B_6 deficiency occurring in the young of mothers receiving a diet high in vitamin B_1 was thought to be conditioned by the excess of vitamin B_1 without a corresponding increase in the intake of vitamin B_6. While the dose of vitamin B_1 given was far in excess of anything likely to be taken in any ordinary diet, a warning is issued against the indiscriminate prescription of large doses of one B vitamin without simultaneous administration of other members of the vitamin B complex.—A. M. COPPING.

—. (1945.) **Biosynthesis of vitamins in the human gut.**—*Brit. med. J.* June 23rd. 879–880. **457**

The evidence for the synthesis and utilization of the B vitamins in the human gut is reviewed in the light of recent clinical and experimental studies by NAJJAR & HOLT (1943), ALEXANDER & LANDWEHR (1945) and other investigators.—A. M. COPPING.

BENESCH, R. (1945.) **Synthesis and destruction of nicotinic acid by the mixed caecal flora of man.**—*Lancet.* **248.** 718–719. **458**

A study was made of aerobic and anaerobic cultures from a sample of mixed caecal flora obtained by washings from the caecum of a patient who had undergone caecostomy for carcinoma of the colon. Nicotinic acid was estimated by the *p*-amino-acetophenone method in whole cultures at intervals up to nine days. In aerobic cultures the content of nicotinic acid increased from 0·4 μg. per ml. at the beginning, to 1·2 μg. per ml. after six days. In anaerobic cultures in which *Clostridium welchii* was the only organism identified, the nicotinic acid content decreased. It was suggested that in the normal caecum an equilibrium exists between organisms producing nicotinic acid and those destroying it and that a disturbance of this equilibrium may be concerned in the aetiology of deficiency diseases.

—A. M. COPPING.

—. (1945.) **Folic acid.**—*Brit. med. J.* July 21st. 91. **459**

This short annotation on a few recent papers summarizes the present incomplete knowledge of folic acid, which is a member of the vitamin B complex and occurs most commonly in green leaves, but also in liver and other rich sources of B vitamins. It is a growth factor for *Streptococcus lactis* R and may be identical with vitamin Bc, the anti-anaemia factor for chicks. The probable role of folic acid in inhibiting tumour growth and in counteracting the effects of some sulphonamide drugs is discussed.—A. M. COPPING.

*UGOLINI, M. (1942.) Sul contenuto di vitamina C nelle urine dei principali animali domestici clinicamente sani. **[Vitamin C in the urine of healthy animals.]**—*Biochim. Terap. sper.* **29.** 187–192. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 275.] **460**

The vitamin C content of the urine of clinically healthy animals was estimated by Tillmann's method. The following values, in mg. per litre, were obtained :– bullock : 3·70–12·30 mg. (average : 6·32 mg.), non-pregnant cow : 0·89–14·90 mg. (5·15 mg.), pregnant cow : 0·91–7·14 mg. (4·57 mg.), calf : 4·40–10·20 mg. (5·96 mg.), stallion : 9·60–22·22 mg. (15·34 mg.), mare : 3·70–29·10 mg. (8·92 mg.), pregnant mare : 5·90–31·40 mg. (12·18 mg.), foal : 4·10–18·90 mg. (9·40 mg.), donkey : 5·40–43·47 mg. (15·93 mg.), mule : 6·25–31·46 mg. (13·74 mg.), pig : 1·92–18·74 mg. (8·03 mg.), sheep : 0·40–8·85 mg. (1·77 mg.), adult dog : 30·30–333·33 mg. (99·22 mg.), adult bitch : 51·45–220·0 mg. (118·34 mg.), young dog : 10·0–77·0 mg. (30·27 mg.).

The relevant literature is reviewed.—E. COTCHIN.

*FERRONI, F. (1942.) Sulla eliminazione delle sostanze a potere riducente (vitamina C) attraverso le urine in alcune malattie dei nostri principali animali domestici. **[The elimination of vitamin C in the urine in some animal diseases.]**—*Biochim. Terap. sper.* **29.** 173–186. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 274–275.] **461**

The vitamin C content of the urine of 15 animals of different species affected with various diseases was estimated, but no significant differences from normal values were noted.—E. COTCHIN.

GOULD, G. N. (1945.) **A preliminary note on digestive disorders of cattle associated with leys and re-seeded pastures.**—*Vet. Rec.* **57.** 365. **462**

Leys and reseeded pastures appear at times to be unpalatable and animals fed exclusively on them often seek out rougher grazing. Digestive disorders, such as tympanites, impaction of the rumen and even enterotoxaemia are, moreover, frequently encountered. For these reasons, it is suggested that animals should be turned on to such pastures for short periods only, or where this is impracticable, that hay or straw should be fed before they are put out to graze.—J. A. NICHOLSON.

UNDERWOOD, E. J., CURNOW, D. H., & SHIER, F. L. (1943.) **Further biochemical studies of pregnancy toxaemia in sheep.**—*Aust. Vet. J.* **19.** 164–173. **463**

Most of the data in this investigation were obtained from cases of pregnancy toxaemia in a flock of Border Leicester × merino ewes mated to Southdown rams and maintained during the last two months of pregnancy on poor green grazing. The material available enabled a study to be made of a number of the metabolic factors in affected ewes, in healthy ewes under similar poor nutritive conditions and in healthy well-fed ewes, in each case with their foetuses. The conclusions were as follows : the serum calcium and blood glucose levels of the affected ewes were slightly lower than those of the healthy, although no cases of definite hypocalcaemia were obtained and the degree of hypoglycaemia was not great ; in both healthy and affected ewes foetal blood sugar levels were about double those of the mothers ; the livers of most of the affected ewes were almost entirely depleted of glycogen, whereas the livers of healthy ewes contained much higher glycogen levels ; foetal glycogen concentrations were high ; there was no significant difference between the liver glycogen contents of the foetuses from the healthy or affected ewes, while the level in each foetus in twin pregnancies was, on the average, as high as in single pregnancies ; the liver vitamin A reserves were quite high in both healthy and affected ewes.

In the light of the above findings and of recent fundamental work on carbohydrate and ketone metabolism, the authors give an account of the probable sequence of metabolic events leading up to pregnancy toxaemia in ewes. They consider that the disease is intimately associated with, if not caused by, a disturbed carbohydrate metabolism due to a combination of low caloric intake and high demand as in late pregnancy and that it can be prevented by maintaining a plane of nutrition sufficient to sustain consistent live-weight increases in the ewe throughout late pregnancy.

—R. L. REID.

See also absts. **400** (nutrition of protozoa), **495** (choline), **499** (ascorbic acid), **533** (nutritional problems in India), **543** (toxaemic jaundice and pregnancy toxaemia of sheep in Australia, diet and wool production), **545, 548** (cobalt deficiency in New Zealand and in Michigan), **548** (milk fever and vitamin D).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

—. (1945.) **Annual review of biochemistry. Vol. 14.** [Edited by LUCK, J. M., & SMITH, J. H. C.] pp. x + 856. Stanford University P.O., California : Annual Reviews, Inc. 8vo. **464**

Of the 28 chapters, in which is reviewed the most important work on various aspects of biochemistry during 1944, there are some which will be of interest to veterinarians. These include "The chemistry and metabolism of the compounds of sulfur", by J. W. H. LUGG, "The chemistry and metabolism of the compounds of phosphorus", by H. M. KALCKAR, "Carbohydrate metabolism", by J. A. RUSSELL, "Fat metabolism", by E. F. GILDEA & E. B. MAN, "The metabolism of proteins and amino acids", by P. P. COHEN, "Mineral metabolism", by J. SENDROY, Jr., "Nutrition", by F. J. STARE, D. M. HEGSTED & J. M. MCKIBBIN, "Water-soluble vitamins", by L. C. NORRIS & G. F. HEUSER, "Fat-soluble vitamins", by J. C. FRITZ, "The chemistry of the hormones", by W. T. SALTER, "Animal pigments", by H. F. HOLDEN, "Detoxication mechanisms", by P. HANDLER and W. A. PERLZWEIG, "The biochemistry of malignant tissues", by J. P. GREENSTEIN, "The chemistry and metabolism of bacteria", by J. M. MUELLER, and "The chemistry of antibiotic substances other than penicillin", by A. E. OXFORD.

This volume maintains the usual high standard of the reviews and there are good author and subject indexes.—R. ALLCROFT.

GAALAAS, R. F. (1945.) **Effect of atmospheric temperature on body temperature and respiration rate of Jersey cattle.**—*J. Dairy Sci.* **28.** 555–563. **465**

G. reports the results of a study of the effect of changes in atmospheric temperature upon the respiration rate and body temperatures of a herd of Jersey milking cows in the Gulf Coast area of Louisiana, an area where the mean temperature ranges from 54°F. in January to 82°F. in July and August and where the humidity is regularly high. Observations were made over a period of four months (June to September) and a total of 3,298 individual recordings of body temperature and respiration rate were made. The cows were milked and fed in a shed but were on pasture where shade was available at other times.

There was a definite relationship between body temperature and air temperature. The average body temperature ranged from 101°F. at an average air

temperature of 50°F. to 103·2°F. at average air temperature of 95°F. The average respirations varied from 20 per min. at an average air temperature of 50°F. to 90 per min. at air temperature of 95°F. There was a marked difference between individual cows in their reaction to high air temperatures.

The effect of variation in relative humidity could not be observed, as humidity was high throughout the experimental period.—M. C.

ANDERSON, J. (1945.) **The semen of animals and its use for artificial insemination.**—*Tech. Commun. imp. Bur. Anim. Breed. Genet.* pp. viii+151. Penglais, Aberystwyth: Imperial Agricultural Bureau, Central Sales Branch. 4to. 7s. 6d. **466**

This publication comprises a comprehensive summary of the extensive literature which has accumulated, mainly in recent years, on the various aspects of artificial insemination. The main text covers literature up to the latter part of 1943; additional matter and later publications are dealt with in a supplement. "The publication is in three parts. Part I is directed particularly to the need of the scientific worker for a detailed review of the literature dealing with the study of semen, the factors which affect its production, and the properties and reactions which affect its use for insemination. Part II embraces a discussion of the use of artificial insemination in the different species, of its application in different countries and circumstances, and of the limitations imposed on its use by various factors, including those arising from the physiological processes of female reproduction. Part III describes the actual techniques of semen collection, examination and handling, and of insemination." A combined author index and bibliography facilitates reference to particular studies. The publication contains numerous illustrations and diagrams reproduced from the original articles.—N. J. SCORGIE.

LAING, J. A. (1945.) **Some factors in the aetiology and diagnosis of bovine infertility.**—*Vet. Rec.* **57.** 275–279. Discussion pp. 279–280. **467**

This is a general account and discussion on the physiological aspects of bovine infertility. The best method of determining the quality of semen is to examine a thick smear under the low-power objective at 37°C. Fertile animals either produce semen showing a marked wave-motion or the smear is packed with actively motile spermatozoa; with infertile animals the spermatozoa are scattered and show only weak oscillatory motion. It was found that the early death of the fertilized ovum accounted for infertility in a number of otherwise healthy animals.—J. A. N.

SALISBURY, G. W., & MERCIER, E. (1945.) **The reliability of estimates of the proportion of morphologically abnormal spermatozoa in bull semen.**—*J. Anim. Sci.* **4.** 174–178. **468**

In the assay of potential fertility of a semen sample, no conclusive evidence has as yet been produced that attention need no longer be paid to the proportion of morphologically abnormal spermatozoa present in the sample. The present report deals with a study on bull semen undertaken to determine how many spermatozoa must be examined on a single smear to obtain a reliable estimate of the proportion of abnormal spermatozoa on that slide. The results show that the calculation of the proportion of abnormal spermatozoa from the examination of a single unit of 100 spermatozoa was as reliable as the examination by a single investigator of 500 cells on each of two slides from the same ejaculate. The data also show that there was rapid improvement in the reliability of making the morphological classification of spermatozoa when an investigator acquired experience. —N. J. SCORGIE.

FRAPS, R. M. (1945.) **Effect of reduced atmospheric pressure on hatchability of the hen's egg.**—*Science.* **101.** 339. **469**

The results of the preliminary tests reported in this note indicated that the hatchability of fertile eggs remained independent of atmospheric pressures over the range 29·9 in. (controls) to 0·9 in. Hg. The latter pressure corresponds to a standard altitude of about 78,000 feet. In view of these findings it seems altogether improbable that reduced atmospheric pressure incidental to air transport of fertile eggs might result in subsequently impaired hatchability. Subjecting eggs to a pressure of less than 0·5 in. Hg resulted in the hatch of only 45% of fertile eggs. This may have been due to a rapid water loss in the eggs, amounting to 7·57% of the initial egg weight in 36 hours.—N. J. SCORGIE.

PARKER, J. E. (1945.) **Relation of time of day of artificial insemination to fertility and hatchability of hens' eggs.**—*Poult. Sci.* **24.** 314–317. **470**

Results reported in this paper indicate that higher fertility and hatchability were obtained when hens were artificially inseminated in the late afternoon than when insemination took place in the early morning or at noon. This higher fertility and hatchability were shown to be related to the fact that a larger percentage of hens have a soft egg in the lower region of the oviduct late in the day. Hens observed by anal palpation to have a hard-shell egg in the oviduct at the time of insemination produced a lower percentage of fertile eggs. P. suggests that it would be possible to increase fertility and hatchability by restricting the mating of hens to the afternoon.—N. J. SCORGIE.

GREEN, W. W., & WINTERS, L. M. (1945.) **The effect of sex on the development of the pig. IV. Histological and endocrinological studies of the boar.**—*J. Anim. Sci.* **4.** 55–62. [For part III, see *V. B.* **15.** 90–91 (abst. 584).] **471**

The results of this study appear to show that the rate of testicular growth and development in the boars of lines of inbred swine was consistently more closely associated with increase in body weight than with the age of the boars, although the difference was not statistically significant. The amount of male hormone (17-ketosteroid) excreted in the urine varied with age, line of breeding and season of farrow. Statistical analysis of the results showed that the various lines illustrated the independent occurrence of factors usually associated with sexual development. Possible causes of these line differences are discussed, as also is their bearing on selection for both early sexual development and rapid gain in body weight.—N. J. SCORGIE.

DVOSKIN, S. (1944.) **Local maintenance of spermatogenesis by intratesticularly implanted pellets of testosterone in hypophysectomized rats.**—*Amer. J. Anat.* **75.** 289–327. **472**

D. points out that in all experiments hitherto reported on the maintenance of spermatogenesis by androgen administration in hypophysectomized mammals, the hormone was injected or implanted at a distance from the testes and that, therefore, the seminiferous tubules in such treatments were subjected only to the blood-borne hormone; in such cases, natural conditions, under which androgen formed by the interstitial cells of Leydig presumably gives rise to a local concentration in the testes, might not be simulated. In the experiments described here, androgen was implanted intratesticularly into young adult rats at the time of hypophysectomy. It was found that in unilateral implantations the testis which contained the implant was stimulated more than the contralateral one except with the highest dosage, that with the lowest dosage

the tubules in the region of the pellet were stimulated more than those which were more distant, and that intratesticular implantation is far more effective in maintaining testicular weight and structure than is subcutaneous implantation. Whilst it is realized that this attempt to duplicate the normal liberation of androgen throughout the testes is very crude, the results appear to supply strong additional evidence of a direct gonadotropic action of testosterone on the seminiferous tubules.—N. J. Scorgie.

Grau, H. (1943.) Das Ganglion nodosum unserer Haustiere. **[The ganglion nodosum in domestic animals.]**—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 281–283. **473**

The ganglion nodosum of the cervical vagus nerve is of importance for the diagnosis of rabies, as it is an almost constant seat of Negri bodies and can be prepared for histological examination when the brain is no longer usable owing to decomposition. The ganglion varies greatly in size in the different species of domestic animals and even in different breeds within a species. It is often invisible, *i.e.*, so thin as to cause no thickening in the nerve cord. G. has, however, determined that it is essentially situated close to the point where the cranial laryngeal nerve is given off from the vagus high up on the side of the neck just under the parotid gland, in all the domestic animals. When, therefore, a short length of the vagus nerve with the cervical laryngeal nerve arising at its middle is cut out, the ganglion will be found to be in the piece removed.—J. E.

Graves, A. P. (1945.) **Development of the golden hamster, Cricetus auratus Waterhouse, during the first nine days.**—*Amer. J. Anat.* **77.** 219–251. [Author's summary copied *verbatim.*] **474**

The early developmental stages of the golden hamster (Cricetus auratus) are described on the basis of the study of 178 embryos, which were preserved at close intervals up to the middle of the ninth day.

The hamster is remarkable for precocity of reproduction in the female sex. The eggs are relatively large and contain considerable amounts of formed yolk.

The hamster is the fastest developing mammal so far known.

A comparison is made of the general course of development of the hamster with that of the opossum and of the rat.

Many features of its development characterize the hamster as a primitive member of the murid family, and as comparatively closely related to geomyid rodents.

See also absts. **422** (heterospecific blood group pregnancy), **438** (blood histamine), **440** (bovine sterility), **441** (physiological effect of suckling on uterine involution), **496** (wound healing), **523, 524** (blood collection and transfusion), **525** (haemoglobin estimation), **549** (speed in animals).

POISONS AND POISONING

Largent, E. J., Machle, W., & Ferneau, I. F. (1943.) **Fluoride ingestion and bone changes in experimental animals.**—*J. industr. Hyg. Toxicol.* **25.** 396–408. **475**

X-ray studies of rabbits fed for periods up to 92 days on a diet containing 12–50 p.p.m. of F failed to reveal any evidence of bone changes despite the development of macroscopic lesions in the bones and a marked increase in the F content of the skeleton. In rabbits, the mandible is a frequent site of gross changes induced as a result of excessive F intake and it is suggested that early stages of F intoxication in human beings might be detected by radiographic studies of the jaw. New bone laid soon after excessive intake of F in rabbits has a non-specific basic architecture with a general resemblance to the callus formed as a result of fracture. —A. Eden.

See also absts. **421** (snake anti-venom), **449** (fluorine hazard), **543** (toxicity for sheep of *Portulacca* spp.), **545** (poison plants of New Zealand).

PHARMACOLOGY, THERAPEUTICS AND DISINFECTION

Florey, H. W. (1945.) **The use of micro-organisms for therapeutic purposes.**—*Brit. med. J.* Nov. 10th. 635–642. **476**

This Lister Memorial lecture is an historical account of antibiotics from the time of Pasteur and Joubert in 1887 and of Vuillemin, who introduced the word "antibiosis" in 1889, to the present day. Pasteur and Joubert noticed that the growth of anthrax bacilli in urine was inhibited by "common bacteria". Garré in 1887 demonstrated the antagonism of *Bacillus cereus* var. *fluorescens* and *Staphylococcus pyogenes* on gelatin plates in petri dishes. Preparations of *Pseudomonas pyocyanea* were used clinically in the treatment of ulcers and other local infections at the end of the 19th century. The first crystalline antibiotic, now called mycophenolic acid, was isolated from a *Penicillium* in 1896. It is possible that "replacement therapy", where a harmful organism is displaced by a non-pathogen (*e.g.*, Metchnikoff's Bulgarian bacillus), depends upon the production of antibiotics. Later, antibiotic action was used to prepare vaccines from bacteria which were lysed by organisms such as *B. cytolyticus*. Many accidental contaminants were found which inhibited growth: thus Zukerman and Minkewitsch (1925) found a *B. mesentericus* which inhibited growth of diphtheria bacilli and Fleming (1929) noticed that accidental contamination with *Penicillium notatum* caused lysis of many pathogenic organisms. Dubos (1939) described the isolation of a very active and selective antibiotic, tyrothricin, from the spore-forming soil bacillus, *B. brevis*. Tyrothricin was later separated into two crystalline polypeptides, gramicidin and tyrocidine. Gramicidin is active against Gram-positive organisms and was used clinically as a local antiseptic. Gramicidin will probably not be used in medicine owing to the introduction of less toxic products with similar action such as penicillin. While crude extracts of *P. notatum* cultures are irritant and toxic, purified penicillin was shown by the Oxford workers to be non-toxic in effective concentrations in animals. Whereas the antibacterial action of sulphonamides is reduced by pus and tissue break-down products, penicillin is not so affected. Penicillin has proved of great value in the immediate prophylactic treatment of war casualties. Penicillin is ineffective against Gram-negative organisms, but streptomycin, isolated from an actinomycete, is a non-toxic antibiotic which inhibits the growth of some Gram-negative organisms.—E. B.

Todd, E. W. (1945.) **Function of autolytic enzymes in bacteriolysis by penicillin.**—*Lancet.* **249.** 172–175. **477**

Lysis of organisms in the presence of penicillin appears to be dependent on autolysins, but lysis only occurs after death, as living organisms are resistant to autolysins. Some organisms (*e.g.* haemolytic streptococci group A) contain very little lysin but may be killed

by penicillin; lysis of these killed organisms occurs if autolysin is added.—E. BOYLAND.

MEYER, J. R. (1944.) Ação bacteriostática de um cogumelo macroscópico pertencente à familia das poriporaceas "Polyporus cinnabarinus (Jacq.) Fries". **[Bacteriostatic activity of a macroscopic fungus belonging to the Polyporaceae group, *Polyporus cinnabarinus*.]**—*Arq. Inst. biol., S. Paulo.* **15.** 27–36. [Author's English summary slightly amended.] **478**

M. describes experiments to test the activity of the extracts of a wood-rotting fungus (*Polyporus cinnabarinus*). Experiments carried out under standard conditions proved that it exerted a marked bacteriostatic effect on several strains of staphylococcus, streptococcus and *Pasteurella aviseptica*. Consideration must be given to the spreading and thickness of the suspension of the bacteria used, to the thickness of the agar layer on which the test is performed, to the hydrogen-ion concentration of the extract and to the time during which the cultures remain in the incubator before the results are read.

—. (1944.) **The use of sulphonamide drugs and certain modern antiseptics.**—*Aust. vet. J.* **20.** 244–246. **479**

At a meeting of the Victorian Division of the Australian Veterinary Association, the uses of the various sulphonamides were discussed in general terms. The toxic effects were summarized, and a comparison was made of the sulphonamides for human use. The local use of sulphonamides and acridine drugs is discussed in a summary of the general principles of antiseptic usage.—H. McL. GORDON.

CAMERON, H. S., & MCOMIE, W. A. (1945.) **Absorption and excretion of sulfaquinoxaline in a ruminant.**—*Cornell Vet.* **35.** 47–51. **480**

Sulphaquinoxaline (2-sulphanilylaminoquinoxaline) given as a drench or in capsules was well absorbed and slowly excreted. Concentrations of over 10 mg. per 100 ml. blood were attained following dosing of 400 mg. per kg. body weight. Doses of over 400 mg. per kg. body weight to lambs caused toxic symptoms including depression, staggering and anorexia. Treatment with sulphaquinoxaline caused a transient hypoprothrombinaemia.—E. BOYLAND.

BRYAN, C. S., HORWOOD, R. E., & HUFFMAN, C. F. (1945.) **A preliminary report on penicillin in the treatment of chronic streptococcic mastitis.**—*Vet. Med.* **40.** 87–89. **481**

The intravenous injection of four doses each of 100,000 units of penicillin was ineffective in the treatment of chronic *Streptococcus agalactiae* infections. The infusion into each quarter of doses ranging from 1,000–400,000 units was almost non-irritant. The infusion of infected quarters in six cows with 5,000 units of penicillin cured four cows with single treatments, while the other two cows responded to a second infusion. Of 24 infected cows infused with 10,000–12,500 units, 18 recovered after a single treatment. Four cows required two and two cows required three treatments. In all, 32 cows were successfully treated, but no cow with marked indurations of the udder was treated.
—E. BOYLAND.

MACKENNA, R. M. B., & COOPER-WILLIS, E. S. (1945.) **Impetigo contagiosa in the army, treated with microcrystalline sulphathiazole.**—*Lancet.* **249.** 357–358. [Authors' conclusions copied *verbatim*.] **482**

Statistical analysis of the results obtained in 1118 uncomplicated cases of impetigo treated in three different ways suggests the following answers to the two questions which the investigation was designed to answer:

Treatment with 15% sulphathiazole administered in either form is significantly better than treatment with lotio cupro-zincica, except for the risk of sensitisation in 2½% of cases. The length of stay in hospital under treatment with either form of sulphathiazole is appreciably shorter than with lotio cupro-zincica.

As between the two forms of sulphathiazole, the advantage lies with the microcrystalline form, but this advantage, though probably significant, was outweighed in 1944 by scarcity of supply.

*NERI, F., & ROSA, A. (1942.) Ricerche chimioterapiche nella infezione tubercolare sperimentale con derivativi di acidi grassi della sulfamidopiridina e della sulfanilamide. **[Treatment of TB. with fatty acid derivatives of sulphapyridine and sulphanilamide.]**—*Riv. ital. Igiene.* **2.** 412–417. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 252.] **483**

A number of rabbits were injected intravenously with 0·005 mg. of tubercle bacilli. For the next 11 days they received daily intravenous doses of 0·12 g. per kg. body weight of fatty-acid derivatives of sulphapyridine or sulphanilamide; similar doses were then given *per os* in olive oil. No effects on the course of the tuberculous infections were noted.—E. COTCHIN.

REIS, J., & REIS, A. S. (1944.) Sobre o uso de resindetantes na água de bebida, para prevenção da cólera aviária. **[On the addition of disinfectants to the drinking water to prevent fowl cholera.]**—*Arq. Inst. biol., S. Paulo.* **15.** 39–41. [Authors' English summary slightly amended.] **484**

Experiments to determine the value of adding disinfectants to the drinking water during an epidemic of fowl cholera showed that of the three tested (methylene-blue, copper sulphate and potassium permanganate) only the second, in the form of a 0·2% solution, could be recommended.

TALIAFERRO, L. G., COULSTON, F., & SILVERMAN, M. (1944.) **The antimalarial activity of tyrothricin against *Plasmodium gallinaceum*.**—*J. infect. Dis.* **75.** 179–211. **485**

Tyrothricin possesses a marked curative and suppressive activity against sporozoite- and blood-induced infections when administered in sufficient amount to small chickens intravenously in a diluent containing 9·5% alcohol. It has no action when administered *per os* in powdered form. It has little or no activity when given intravenously as a finely dispersed suspension in distilled water or when given intraperitoneally either in alcoholic or aqueous media. Curative effects are obtained when effective amounts of tyrothricin are given during the acute stages of the infection. The incubation period is lengthened of blood-induced but not of sporozoite-induced infections. When given either from the time of infection or from the time parasites first appear in the blood through the acute infection and first part of the developed infection, the peak of the acute infection is markedly lowered and, although slight relapses occur, fatal relapses are prevented in both sporozoite- and blood-induced infections. A dose of 0·2 mg. given from the beginning of the infection is no more effective in lowering the peak than one given from the time the parasites first appear in either sporozoite- or blood-induced infections. The same dose of 0·2 mg. suppresses the acute rise of blood-induced infections to a greater extent than of sporozoite-induced infections. Doses of 0·1 mg. and 0·05 mg. given from the beginning of the infection through part of the developed infection of blood-induced infections do not cause an appreciable lengthening of the incubation period and are less effective in reducing the severity of the infection than larger doses begun at the time when the

parasites are first found in the blood. A few large doses given during the early part of blood-induced infections, curtail the acute rise but fatal relapses tend to occur. Large doses administered during the later stages of the acute rise in blood-induced infections become decreasingly effective. Tyrothricin exerts parasiticidal effects whereas quinine inhibits the reproduction of the parasite. The two drugs given together are more effective and may possibly act synergistically.—C. H. S.

FEATHERLY, H. I., & HARMON, K. S. (1944.) **Preliminary experiments with Amorpha Fruticosa on cattle grubs.**—*J. Amer. vet. med. Ass.* **105.** 291–293. **486**

Preliminary experiments are recorded on the use of an acetone extract of the fruits of the leguminous shrub *Amorpha fruticosa* for the destruction of *Hypoderma* larvae in cattle. The extract from 100 g. of the fruits was made into a 10% emulsion with one litre of distilled water. Two tests were performed. In the first, four steers were treated with the emulsion in strengths from 3–10% and also with the emulsion mixed with soap. In the second experiment, seven animals were treated using 10% and 5% solutions alone and mixed with soap. It was found that the 10% emulsion killed the larvae on all the animals treated. Emulsions under 10% strength or mixed with soap gave poorer results. The number of animals used in the experiments was too small for final conclusions to be made, but the preliminary results were promising.—T. E. GIBSON.

CAMERON, T. W. M. (1944.) **Fly sprays and repellents.**—*Canad. J. comp. Med.* **8.** 254–258. **487**

A broad review is given of D.D.T. including its history, preparation, properties and physiological actions. This is followed by more specific information regarding some of its uses. In the form of gesarol sprayed on the walls, it remains effective against flies for at least three months.

Experiments conducted by C. indicate that a 1 : 10,000,000 dilution of D.D.T. killed all larvae of *Culex tarsalis* in 12 hours, and all pupae in 48 hours. Before D.D.T. can be recommended to farmers for use against crop pests and insects injurious to livestock, many more experiments must be conducted to learn if the drug injures plants and whether it is dangerous to livestock, wild animals, birds, beneficial insects like the bee, and fish.

In conclusion, C. states that " D.D.T. is a product of great value under certain circumstances. It has played a great part in the present war and has great possibilities for the future. It has, however, certain disadvantages which are not yet fully understood and it must still be used with caution."—THOS. MOORE.

*MADAUS, G., & KOCH, F. E. (1943.) Experimentelle Untersuchungen über die Ursache der rattenscabieshеilenden Wirkung von *Artemisia absinthium* (Wermut). **[Treatment of rat scabies with wormwood.]**—*Z. ges. exp. Med.* **111.** 701–708. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 92.] **488**

An account of the use of a proprietary preparation of wormwood, given *per os* for the treatment of scabies. In experiments on infected rats, given at the same time a specially devised diet rich in vitamins, especially those of the B complex and C, it is claimed that cures were effected in 4–6 weeks.—J. B. CRAGG.

WILSHAW, R. H. (1945.) **Scabies in a rural district. Value of tetmosol.**—*Lancet.* **249.** 348. [Author's summary copied *verbatim*.] **489**

In two years 369 patients have been treated with tetmosol. The treatment has been given in the home with only indirect supervision by district nurses and sanitary inspectors and has resulted in 100% of cures, without reinfection.

BURSKIĬ. (1943.) Stimulyatsiya rosta volos u loshadeĭ posle perebolevaniya chesotkoĭ. **[Stimulation of hair growth in the horse after mange.]**—*Veterinariya, Moscow.* No. 1. p. 42. **490**

B. tried to stimulate hair growth by massaging the affected parts with glycerin, with 0·5% salicylic ointment or with a mixture of 0·5 g. salicylic acid, 0·5 g. phenol, 0·5 g. boracic acid and 100·0 g. rectified spirit, 24 hours after gas treatment with SO_2.

On the second day after treatment with glycerin or with salicylic ointment, the skin became softer and oilier in appearance ; on the 5th–6th day it was smooth and elastic with the appearance of a thick growth of new hair and on the 10th–12th day the hair was of normal growth. Treatment with the spirit mixture gave basically the same results except that on the 5th–6th day the skin remained somewhat dry and slightly crusted in parts.—E. CHERKESI.

KLINE, E. E., & HAWKINS, P. A. (1944.) **Treatment of lice with phenothiazine.**—*M[ich.] S[t.] C[oll.] Vet.* **4.** 70–71. **491**

From a series of tests it was found that phenothiazine is very efficient against sucking lice of various animals, but has no effect on biting lice. The amount of phenothiazine necessary was not determined, and in only one test was an amount (5%) used which would be economical in practice.—W. MOORE.

JACQUET, J., & QUARANTE, M. (1943.) Emploi de la phénothiazine comme antidiarrhéique et anthelminthique chez les Bovidés. **[Use of phenothiazine as an antidiarrhoeic and anthelmintic in cattle.]**—*Bull. Acad. vét. Fr.* **16.** 344–348. **492**

A description is given of 19 cases of a series of 47 observed in practice. Phenothiazine, even in small doses, was found to be effective in controlling in these cattle, both diarrhoea due to helminth infestation and that due to other causes. The drug was effective against helminth infestations of cattle, the dose employed being 0·3 g. per kg. body weight for 1, 2, or 3 days after the confirmation of diagnosis. The authors state that phenothiazine is effective against coccidia. The drug was found to be non-toxic except in one case, in which toxic symptoms were shown after two doses of 100 g. each had been given ; nervous symptoms were manifested, accompanied by urticaria. In two other cases a benign pityriasis developed.—T. E. GIBSON.

SAVEL'EV, G. S. (1943.) Ponosy u telyat i mery bor'by. **[Control and treatment of calf diarrhoea.]**—*Veterinariya, Moscow.* No. 1. pp. 17–19. **493**

S. discusses the selecting, breeding and calving of cows and the care and feeding of newborn calves.

A reduced diet is recommended in early cases of diarrhoea, which may develop in the first 2–5 days of the calf's life ; either one or two feeds are stopped or boiled water, to which 1 g. salol-tannin is sometimes added, is given instead of milk. The use of laxatives and enemas is not recommended.

A detailed clinical picture is given of diarrhoea and the complications which may set in on the 30th–40th day when a change is made to green fodder.

—E. CHERKESI.

HOLM, G. C. (1944.) **A preliminary report of the use of lentin in atonic indigestion of dairy cattle.**—*Vet. Med.* **39.** 414–416. **494**

Twenty cases of atonic indigestion in dairy cows were treated by the intramuscular injection of 1·5–2·0 mg. lentin, accompanied by oral dosage of 1 oz. sodium thiosulphate, 90 grains tartar emetic, ginger and

gentian. Eight other cases received similar treatment, except that the lentin injection was omitted. Large quantities of water were administered to dehydrated and toxic cases. All animals returned to feed within two days, but milk production was restored more promptly and more completely with lentin than with routine therapy. Recovery was accomplished in about 15 days. Prompt recognition of the condition was essential, as 24 hours' delay in treatment postponed the return to normal by about seven days. Lentin may be given with safety to cows as late in calf as seven months. —A. B. PATERSON.

—. (1945.) **Dosage and effects of choline chloride.**—*Brit. med. J.* Oct. 27th. 573–574. **495**

This article discusses briefly the dosage and effects of choline chloride in man, the discussion being timely in view of the possibility of further therapeutic trials with choline in diseases of the liver and kidneys. Choline is now regarded as an important constituent of the vitamin B complex concerned with fat transport in the body and with the maintenance of health of the liver and kidneys. In man the dose of choline chloride is at least 100 mg. per kg. body weight, the curative dose being close to the toxic dose. When large doses are employed there is a danger of a sudden flooding of the circulation with choline, resulting in a depression of the heart and blood pressure. The administration of choline therefore requires close supervision. Risks of depression of the bone marrow are probably small, but the blood count should be watched until further information is available on the effects of high dosage upon the bone marrow.—T. E. GIBSON.

HOFFMAN, R. S., & DINGWALL, J. A. (1944.) **An experimental and clinical study on the use of adult animal tissue extract in the acceleration of wound healing. A preliminary report.**—*Surg. Gynec. Obstet.* **79.** 103–108. **496**

Sterile adult sheep hearts were minced and extracted with Tyrode's solution for 24 hours in the refrigerator. The extract obtained on centrifuging was clear and the growth-accelerating property remained for a month. The material was tested on eight dogs with bilateral experimental wounds; in every case the treated wounds healed 40% faster than the controls. Clinical wounds treated with the extract healed more rapidly than would have been expected had no treatment been given.—E. B.

See also abst. **432** (disinfection of lungworm larvae).

HYGIENE, PUBLIC HEALTH AND VETERINARY SERVICES

WILSON, F. L., & TANNER, F. W. (1945.) **Behavior of pathogenic bacteria in fermented milks.**—*Food Res., Ill.* **10.** No. 2. 122. [Abst. in *J. Dairy Sci.* **28.** No. 7. A 91, copied *verbatim.*] **497**

The authors present a rather complete review of the literature dealing with the survival of pathogenic bacteria in fermented milk products and a study of persistence of *Eberthella typhosa, Salmonella paratyphi, Salmonella schottmulleri, Shigella dysenteriae* and *Shigella paradysenteriae* Flexner in lactic, acidophilus, and Bulgarian buttermilks.

The above pathogens were destroyed more rapidly when lactic acid was added to milk than when developed through ripening. In fermented milk with acidities of 0·95 to 1·15 per cent (pH 4·2 to 3·9) pathogens survived one day to seven weeks; with acidities of 0·50 to 0·86 per cent (pH 5·0 to 4·3) the survival was two to nine weeks.

The conclusions are that fermented milks may carry viable pathogens. They should always be prepared from pasteurized milk and should be handled as carefully as fluid bottled milk.

CAMPBELL, A. G., & GIBBARD, J. (1944.) **The survival of *E. typhosa* in cheddar cheese manufactured from infected raw milk.**—*Canad. J. publ. Hlth.* **35.** 158–164. **498**

Cheddar cheese was manufactured by a commercial process from vats of raw milk experimentally infected with *Salmonella typhi.* In general, under experimental conditions, most of the organisms were dead after a period of three months in cheese stored at 58°–60°F., whereas in similar cheese stored at 40°–42°F. they remained viable for at least six months and in the majority of cases for ten or more months. The size of the inoculum used to infect raw milk does not seem to be a factor nor is there any relation between acidity and viability of *S. typhi* in cheese. All cultures recovered and tested at the end of the experiment were in the smooth Vi phase.—J. L. BYRNE.

KRUKOVSKY, V. N., & GUTHRIE, E. S. (1945.) **Ascorbic acid oxidation a key factor in the inhibition or promotion of the tallowy flavor in milk.**—*J. Dairy Sci.* **28.** 565–579. [Authors' summary copied *verbatim.*] **499**

Ascorbic acid oxidation in the milk during storage at low temperature is an essential link in a chain of the reactions resulting in the development of the tallowy flavor. The reaction which produces the tallowy flavor could be inhibited by quick and complete photochemical or chemical oxidation of ascorbic acid in the milk to dehydroascorbic acid prior to its pasteurization and storage. Partial oxidation of ascorbic acid stimulates the development of the tallowy flavor. The promotion of the tallowy flavor by added copper (0·1 p.p.m.) in the presence of dehydroascorbic acid only, is much less effective as compared with that in milk containing ascorbic acid. The tallowy flavor is not promoted by added copper (0·1 p.p.m.) in the milk completely depleted of its total vitamin C content by quick oxidation of ascorbic acid to dehydroascorbic acid and the subsequent heat treatment that takes place in pasteurization. The reaction which produces the tallowy flavor could be induced again by the addition of ascorbic acid to milk which was first depleted of its ascorbic acid or of the total vitamin C content.

CUTBILL, L. J. (1945.) **Tea-making and tuberculous milk. [Correspondence.]**—*Brit. med. J.* Oct. 13th. 514. **500**

C. discusses the use of non-pasteurized tuberculous milk in tea-making and the possible destruction of the tubercle bacilli by the heat of the beverage. In tests where heavily infected milk was used and tea was prepared in the usual household manner, the tubercle bacilli appeared to be killed by the heat and the cultures obtained proved negative in every case. C. emphasizes that it would be unwise to conclude that complete sterilization takes place in every case, when the method and conditions of tea-making vary so considerably. —J. H.

*BERNELLI, E. (1941.) Ricerche sperimentali sulla batteriologia del burro nei riguardi dell'infezione tubercolare. **[Significance of tubercle bacilli in butter.]**—*Ann. Microbiol.* **1.** 192–201. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 295.] **501**

B. pleads for more field investigations into the role in the spread of TB. played by cream and butter, made from improperly pasteurized milk or cream.

—E. COTCHIN.

I. KELLER, H. (1943.) Tuberkelbakteriengehalt des Fleisches und Beurteilung tuberkulöser Schlachttiere. **[Tubercle bacilli in meat and the action to be taken concerning tuberculous carcasses.]**—*Z. Fleisch- u. Milchhyg.* **54.** 31–36. **502**

II. BELLER, K. (1943.) Bakteriologische Bemerkungen zu den Ausführungen von Prof. Keller. **[Remarks on I.]**—*Ibid.* 36–38. **503**

I. K. describes his investigation of 110 cases (84 cattle, 24 pigs and 2 calves) in an attempt to establish the relationship between the pathological and anatomical manifestations of TB. and the presence of tubercle bacilli in the meat. Samples were taken from the peronaeus tertius and radial muscles and in 19 cases tubercle bacilli were isolated. This result is discussed and analysed and doubt is thrown on the adequacy of the German meat regulations for tuberculous carcasses.

II. The methods of investigation adopted in I are described and the cultural and animal inoculation tests are compared.—O. D. JAMES.

*HARTH, F. (1941.) Ist die stickige Reifung der Warmblütermuskulatur ein abakterieller Vorgang? **[Is the sour fermentation of meat a non-bacterial phenomenon?]**—*Inaug. Diss., Giessen.* pp. 109. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 294–295.] **504**

"Sour fermentation" is a non-bacterial enzymatic autolysis occurring in carcasses not allowed to cool properly and is quite distinct from "stinking sour fermentation", which is a bacterial putrefaction seen in carcasses from which the intestines are not removed immediately after slaughter.—E. COTCHIN.

MEYER, R. (1943.) Zur Statistik der Fleischvergiftungen im Jahre 1942. **[Meat poisoning statistics in Germany for 1942.]**—*Z. Fleisch- u. Milchhyg.* **53.** 211–214. **505**

During 1942, 32 outbreaks of meat poisoning were recorded, involving 1,357 cases of illness and 15 fatalities. Most cases were recorded from May to October and sausages were their chief cause, followed by beef, pork, horseflesh, etc. In general, figures showed a decrease compared with those of the previous year but there were more cases of poisoning by meat from emergency slaughter which caused 74·4% of the illnesses and 40% of the deaths.

Three deaths and 362 cases of illness followed the consumption of sausage made from horse meat, although raw and cooked meat from the same horse was eaten without ill-effect. *Salmonella typhi-murium* was isolated from the sausages and from the patients. There were six out-breaks of poisoning following consumption of beef resulting from emergency slaughter. One person died and 600 were affected. The one case of poisoning from veal occurred when the carcass of a calf was dug up and distributed secretly in a camp for Polish workers. Seventeen were seriously ill and *S. enteritidis* was isolated from most of the patients. Pork was responsible for six outbreaks in which one person died and 14 were ill. There were four cases of botulism after the consumption of bacon and salt pork and one person died with symptoms of botulism after eating pork salted by himself and inadequately preserved. Sausages caused 259 cases of illness and six deaths in 12 outbreaks and *S. typhi-murium* was isolated in two instances. Two fowls which had died caused death in two and illness in three persons. Shell and other fish and various other meats were responsible for four outbreaks of poisoning. There was an increase in the number of cases resulting from the slaughter of animals for domestic use.

Bacterial investigation revealed *S. typhi-murium* as responsible in 40·6% and *S. enteritidis* as responsible in 3·13% of the outbreaks. *Bacterium coli* and cocci were found only once but in conjunction with *Proteus hominis* in two other cases. In one outbreak of poisoning in which 60 were ill and one died the cause was identified as broth containing nitrite pickling salt at 27 times the recommended strength. Eight deaths and 85 cases of illness were reported to be due to trichinosis; this shows a remarkable decrease, especially as most of the cases were from the lands annexed in the East.

—S. M. G.

PEATT, E. S. W. (1945.) **The Army veterinary services in India and Burma.**—*Vet. Rec.* **57.** 219–221. **506**

This is an account of the organization and work of the Royal Army Veterinary Corps in India subsequent to the entry of Japan into the war. At the outbreak of war and until Japan invaded Burma, the army veterinary service was being retrenched. The Burma campaign made a return to animal transport necessary and both the Royal Army Veterinary Corps and the Indian Army Veterinary Corps expanded to ten times their pre-war strength. An officers' training school capable of accommodating 50 students at a time was established to train newly commissioned officers, who had little experience of India or of tropical diseases. The school was part of a general training centre which dealt with 1,200 men at a time.

The work of the veterinary service is varied and covers care of transport animals, military dairy farms, collection, inspection, fattening and slaughter of food animals, breeding of pigs, rabbits and poultry to supplement meat rations, and laboratory and chemical defence research.

The transport animals include horses, mules, donkeys, bullocks, camels and elephants. The military dairy farms supply milk, butter, and cheese and the stock of milch cows and buffaloes has been increased from 10,000 to over 60,000, to make this one of the biggest dairy organizations in the world. Shortage made it necessary for slaughter stock to undergo long train journeys sometimes lasting 7–10 days; these long journeys, with rests every 48 hours, exposed stock to risk of infection. All cattle were protected against rinderpest and many sheep and goats against rinderpest and anthrax.

Among the many diseases which were of almost daily occurrence, the following are mentioned. Anthrax was common in parts of Burma and on the lines of advance in India. Horses, mules and cattle are protected with spore vaccine every six months. Strangles was very virulent in two big remount depots where the mortality was in the neighbourhood of 16%. Sulphanilamide therapy is giving encouraging results. No cases of epizootic lymphangitis occurred until 1944. Affected animals were destroyed, but cases became so numerous that experimental treatment in isolation is now being tried [no details are given]. A few serious outbreaks of glanders occurred but were quickly controlled by the use of mallein.

Pasteurellosis has caused serious losses in neither cattle nor buffaloes, but enormous losses have occurred in ducks, fowls and rabbits. Salmonellosis has at times caused heavy loss in ducks.

There was a serious outbreak of surra in horses and mules on the Assam-Burma frontier in 1942. Many thousands of animals contracted the disease and at one time 17% were out of action as a result. Control measures reduced the incidence from 17% in 1942 to 2% in 1944. Early diagnosis is possible only by

examination of wet blood films and millions of these have been examined. Treatment was by intravenous injection of antrypol [naganol], and has been developed to such a degree that 90% recoveries are claimed.

Foot and mouth disease is very widespread but causes little mortality except occasionally in young pigs.

Variola frequently occurs when newly purchased buffaloes are introduced to military dairies; these are now vaccinated with the same lymph as is used for the vaccination of human beings.

Caprine contagious pleuro-pneumonia has proved very intractable.

Rinderpest is widespread and all cattle and buffaloes are immunized with goat-adapted virus as soon as possible after purchase. Severe reactions are common in buffaloes; to avoid these a dose of antiserum is given simultaneously with the virus. [The incidence of the disease in sheep and goats is not mentioned.]

Ranikhet disease [Newcastle disease or pseudo fowl plague] has caused enormous losses and vaccine prepared at Mukteswar is now being tried on a large scale and is said to be giving good results.

A further article on the activities of the veterinary services during operations in Burma is promised.

—M. C.

NEVIN, S. M. (1944.) **U.S. Army veterinary service in Australia.**—*Bull. U.S. Army med. Dep.* No. 81. pp. 113–119. **507**

The veterinary service of the U.S. Army in Australia was organized and is administered by the Veterinarian, Office of the Surgeon, United States Service of Supply. Its main activities are in connexion with servicing animals, food inspection, meat packing and supervising dairy products.

Servicing of animals has not been difficult since glanders, equine infectious anaemia, equine encephalomyelitis and rabies do not occur; in tropical regions only parasitic diseases have given any cause for anxiety.

In food inspection no major difficulties have been encountered since Australian standards are high and grading is extremely accurate. The Australian veterinary inspection which is in force at all large abattoirs has been fully acceptable to the U.S. Army except at a few smaller plants, where inspection is conducted by so-called State Inspectors whose qualifications vary but who are not veterinarians.

Conditions in the large meat-packing plants are exceptionally good, but are less satisfactory in some smaller plants. *Onchocerca gibsoni* infests about 80% of beef cattle from the central and northern areas, causing nodules in the briskets and stifle joints. All stifle joints are therefore opened for inspection and briskets are entirely removed from forequarters exported to Britain. Cattle shipped by rail are often roughly handled and rejections for bruises are frequent.

The dairy plants in the large cities are good but in the provincial centres only fair. Fresh milk from tuberculin-tested cows has, however, been readily available for all troops.—D. D. OGILVIE.

GUNN, R. M. C. (1943.) **The veterinarian and the war.**—*Aust. vet. J.* **19.** 26–28. **508**

The Council of the Australian Veterinary Association was of the opinion that apart from the officers of the A.A.V.C. adequate staffs of veterinarians must be maintained as meat and food inspectors, government administrative officers, field officers, officers in diagnostic laboratories and teachers in veterinary schools; practitioners must be maintained to deal with economic and food-producing animals and other available and suitable veterinarians could be usefully utilized in connexion with dairy, veal, pig and poultry production.

—H. McL. GORDON.

—. (1943.) **Summary of submissions by the Australian Veterinary Association on "The place of veterinary science in rural reconstruction".**—*Aust. vet. J.* **19.** 174–177. **509**

The efficiency and prosperity of the livestock industry in the post-war period will be dependent upon the development of highly productive strains of livestock, the provision of supplies of foodstuffs adequate in quantity and quality for high production, the application of scientific methods in breeding, feeding and management, the maintenance of freedom from disease, and efficient marketing. A national veterinary service must provide an efficient organization for disease control, quarantine, meat and food inspection, research into disease and animal production problems, extension services, clinical services and education. The annual loss from death and diminished production of livestock caused by disease is estimated at not less than 10% (£15,000,000) of the gross value of livestock production. The potential capacity of existing strains of livestock allows scope for a great increase on *per capita* production. In Australia the ratio of veterinarians to livestock population is one of the widest in the world. The summary covers these matters in greater detail and gives the recommendations made to the Rural Reconstruction Commission.—H. McL. GORDON.

IVANOVSKIĬ, V. (1943.) **Zadachi veterinarii v 1943 godu. [Veterinary problems for 1943.]**—*Veterinariya, Moscow.* No. 1. pp. 1–4. **510**

This was a New Year article of encouragement and reproof addressed to veterinary workers and particularly to veterinary surgeons and assistants practising in outlying regions of the U.S.S.R. The stimulating effect of the Red Flag competition among veterinary services, in which the winning service retains the Red Flag for the year, is described.

Problems to be tackled in 1943 were the general hygienic and prophylactic measures practicable in winter, the disinfection and repair of buildings, disposal of carcasses, and the preservation of young stock during the calving season, as well as immunization and the training of veterinary assistants, etc. A more extensive use of the anti-anthrax vaccine "STI" was recommended. Efforts had to be made to combat helminthic infestations and an extensive plan of campaign was worked out with the help of the All-Union Institute of Helminthology; such a campaign was successfully carried out in Ordzhonikidze region in 1940.—E. CHERKESI.

BOROVICH, A. A. (1943.) **Soveshchanie nachal'nikov vetupravleniĭ NKZ soyuznykh respublik. [Conference of veterinary directors of the agricultural ministers of the federated republics.]**—*Veterinariya, Moscow.* No. 10–11. pp. 9–10. **511**

B. summarizes the reports given to the Conference of Veterinary Directors in August, 1943. The successful treatment of calf paratyphoid was reported from the Republic of Georgia and the successful treatment of mange by the use of local plants was reported from the Kirghiz Republic; some reports were limited to a few statistics.

The incidence of non-infectious diseases, although on the decline is still very high; greater concentration of effort in this direction is required.

Delegates complained of the unsatisfactory state of veterinary supplies and all agreed that in stock-taking and accountancy the standard was generally very low. Local control and inspection need improvement; often inspectors do not exercise their proper functions and in some cases posts are vacant.—E. CHERKESI.

—. (1943.) Serviços veterinários do Império. [**Veterinary services in the Portuguese Empire.**]—*Rev. Med. vet., Lisboa.* **38.** 288–290. **512**

The constitution of the veterinary services in Angola is outlined. All veterinary services are under the control of the Central Department of Veterinary and Animal Husbandry Services, situated at Luanda. The highest professional grade comprises 20 veterinary surgeons including four service heads, with a salary of 78,000 angolares, veterinary heads (provisional division) with a salary of 57,000 angolares and veterinary surgeons of the first and second class, with salaries of 48,000 and 39,000 angolares respectively. The salaries are also listed of provincial officers located at the various stations named. The total expenditure on the service is over 3,673,045 angolares and the usual term of office is six years, the period varying with the climate of the region.

The most important diseases are bovine contagious pleuro-pneumonia, anthrax, trypanosomiasis and piroplasmosis. Two or three principal veterinary officers are named. [£1 = approximately 102 angolares.]

—K. J. SINCLAIR.

See also abstr. **378** (salmonella food poisoning), **428** (hydatid disease in New Zealand).

TECHNIQUE AND APPARATUS

ALLISON, V. D., & SMYTH, J. A. (1945.) **Sources of error in the microscopic examination of specimens of sputum for tubercle bacilli.**—*Mon. Bull. Min. Hlth emerg. publ. Hlth Lab. Serv.* **4.** 105–107. **513**

The authors draw attention to the risk of false positive reports in the microscopic examination of specimens of sputum for tubercle bacilli, associated with the use of 1 oz. screw-capped bottles as specimen containers, since suspensions of sputum containing bacilli may seep between the washer and the cap. To avoid this the washer and metal cap should be taken apart and scrubbed before sterilizing and reassembling.

—ANTHONY BUXTON.

BOQUET, A., & DE GROLIER, A. (1942.) Essais d'atténuation de bacilles tuberculeux par culture sur pomme terre biliée. [**Attempts at attenuation of tubercle bacilli by cultivation on bile-potato medium.**]—*Ann. Inst. Pasteur.* **68.** 5–30. **514**

The authors attempted to produce strains of *Mycobacterium tuberculosis* of different degrees of attenuation by prolonged cultivation on Calmette's glycerol bile potato medium, but found considerable irregularities in the loss in pathogenicity. In general, the rate of attenuation was directly related to the original degree of pathogenicity, *i.e.*, strains which initially were highly virulent took several years to reach a stage at which they no longer produced progressive lesions, whereas those of moderate virulence became attenuated after a small number of passages.

The stages which the authors recognize are (1) an increase in the minimal lethal dose, (2) a retardation in the progress of the disease with a tendency to the production of non-progressive lesions and (3) a strict localization of the organisms to the site of injection and the adjacent gland.

By using strains at different stages, they hoped to induce a solid immunity in g. pigs and rabbits, starting with a completely avirulent variant and following up with strains of graded degrees of attenuation. It was found, however, that the resistance induced by any given strain against a highly virulent test dose was irregular. The best results were obtained with *M. tuberculosis hominis* (*ratti*) and were attributed to some quality of the strain before attenuation which allowed it to conserve its antigenic properties.—R. E. GLOVER.

FRIEDMANN, I. (1945.) **Rapid growth of *M. tuberculosis* in an embryonic tissue medium containing penicillin.**—*Tubercle, Lond.* **26.** 75–82. **515**

Rapid growth of *Mycobacterium tuberculosis* was obtained on a medium containing 0·5–1·0 ml. minced chick embryo 11–12 days old in 25 ml. of Tyrode's solution to which had been added 300–500 units of penicillin to reduce contamination. Good growth was obtained in 3–10 days with laboratory strains and with organisms from tuberculous sputa, numerous bundles of newly grown bacteria being present in stained smears. Material from tuberculous lesions was treated for 20 min. with 6% H_2SO_4, and washed three times with sterile saline; 1 ml. of the washed deposit was then inoculated into the tissue culture medium. Rapid growth of *Mycobact. tuberculosis* occurred, comparable with the growth of other organisms in broth media, smears showing curved bundles of tubercle bacilli after eight days. Direct smears without cultivation showed very few organisms and no characteristic grouping. Incubation at 37°C. for 2–3 weeks permitted differentiation of human, bovine and avian cultures on a morphological basis. The human type showed many Medusa-head-like colonies, the bovine type tended to form compact colonies with a few snake-like bundles, and the avian type had organisms scattered widely in loose groups.—A. B. PATERSON.

POWELSON, D. M., & MCCARTER, J. R. (1944.) **The cultivation of human tubercle bacilli on egg mediums.**—*J. infect. Dis.* **75.** 95–101. **516**

The authors showed that Hohn's medium and Petragnani's medium, both containing dye and glycerin, are superior to Corper's simple egg medium for use in the routine cultivation of tubercle bacilli from lesions. The objections to Corper's medium are the oily surface, rendering early detection of colonies difficult, the high cost of material and the liability to contamination. The inclusion of dye in Corper's medium increases the lag period of growth of tubercle bacilli without making the liability to contamination less than on Hohn's medium. The addition of glycerin to Corper's medium did not lead to an increase in the number of colonies of the tubercle bacilli. It is suggested that a single efficient and dependable medium is adequate for primary cultivation of tubercle bacilli, provided specimens are cultured in duplicate.—A. B. PATERSON.

LARSON, C. L. (1945.) **The relative value of liquid media, glucose cystine blood agar, and mouse inoculation in the titration of *Pasteurella tularensis*.**—*Publ. Hlth Rep., Wash.* **60.** 863–868. [Author's conclusions copied *verbatim*.] **517**

P. tularensis grows for at least 22 passages during a period of 60 days in liquid medium without loss of virulence for white Swiss mice. Glucose cystine blood agar is still the artificial medium of choice for routine cultivation of *P. tularensis*.

JONES, R. E., & HANDLEY, W. R. C. (1945.) **A selective medium for the isolation of salmonella bacilli from heavily contaminated material.**—*Mon. Bull. Min. Hlth Emerg. publ. Hlth Lab. Serv.* **4.** 107–111. **518**

The authors have found that the incorporation of hydroquinone (1 : 4,000) or cacotheline (1 : 1,500) in beef infusion broth containing brilliant green (1 : 50,000) is of great assistance in the isolation of salmonella

organisms from morbid material. These substances inhibit the growth of *Proteus*, *Bacterium coli* and many paracolon types. *Aerobacter aerogenes* is not inhibited by the addition of these substances to the medium, but it can be eliminated by substituting a soft agar base for broth in the primary culture, using Craigie's tubes.

The authors give details of the preparation of the media recommended.—ANTHONY BUXTON.

NEWMAN, R. W. (1945.) **A synthetic medium for determining citrate-utilizing, hydrogen sulfide-forming bacteria.**—*J. Lab. clin. Med.* **30.** 56–62. **519**

N. describes the composition of a ferric ammonium citrate synthetic medium used in conjunction with a peptone hydrogen sulphide indicator medium.

By employing this medium, he was able to differentiate *Bacterium coli* from *Escherichia freundii*, and both of them from *Aerobacter aerogenes*. Similarly, some members of the salmonella group of organisms can also be differentiated.—A. BUXTON.

*CSONTOS, J., & DERZSI, D. (1943.) **[Pure culture of *Trichomonas foetus*.]**—*Állatorv. Lapok.* **17.** 98. [Abst. from abst. in *Dtsch. tierärztl. Wschr.*/*Tierärztl. Rdsch.* **52/50.** 152.] **520**

By making a simple modification in the Sedelmeier method, it is possible to prepare a solid culture medium for producing pure cultures of *T. foetus*. The secretion containing *Trichomonas* is first planted into a broth adjusted to pH 8·0 containing 1% peptone and 1·5% glucose enriched with horse serum. A subculture is then made on a solid medium prepared as follows. A broth containing 1% peptone and 1·5% glucose is mixed with 2% agar and adjusted to pH 8·0, sterilized and cooled to 50°C. An equal quantity of a bacteria-free serum is then added. The mixture is then carefully mixed, poured into petri dishes and allowed to set. An agar culture of *Chromobacterium prodigiosum* (2–3 loopfuls) is placed on one half of the agar plate and the *Trichomonas* culture on the other half of the plate which is then sealed and incubated. [*Chromobact. prodigiosum* uses up the available oxygen and enables *Trichomonas* to grow anaerobically.] Spreading colonies usually appear after 24 hours, and after 2–3 days the *Trichomonas* may be transplanted free from any contamination into a serum broth.—C. HORTON SMITH.

PEREIRA, C., & DE CASTRO, M. P. (1943.) Um método de impregnação argêntica para o estudo da morfologia interna de invertebrados microscópicos em toto-montagem. **[A silver impregnation method for *in toto* mounts for the study of the internal morphology of microscopic invertebrates.]**—*Arq. Inst. biol., S. Paulo.* **14.** 207–212. [English summary.] **521**

The reagent used is Hortega's ammoniacal silver carbonate complex, made up to twice its volume with bi-distilled water. For arthropods and platyhelminths, the specimen is washed and treated with warm 2% sodium carbonate solution for 5–10 min. It is washed in tap water, treated with 1% ammoniacal solution for 30 min. and washed in bi-distilled water for half an hour, the water being changed three times during the washing; it is then impregnated with warm (60°C.) silver carbonate solution (1 drop to 10 ml. of bi-distilled water) for half an hour, or for 12 hours at room temperature, and washed in bi-distilled water for half an hour. Reduction to silver takes place in 1% neutral formalin is 30 min., after which the specimen is washed in bi-distilled water for 5 min., dehydrated in absolute alcohol for half an hour at 60°C. or for 12 hours at room temperature, the alcohol being changed in the last 10 min. The specimen is cleared in methyl benzoate and mounted in balsam.

Nematodes are treated similarly but are given an extra dehydration in 95% alcohol after placing in collodion on a slide. The above technique stains internal organs brown; chitinous structures are clearly defined.—K. J. SINCLAIR.

ALEKSANDROV, N. A. (1943.) K tekhnike intravenoznykh vlivaniĭ. **[The technique of intravenous transfusion.]**—*Veterinariya, Moscow.* No. 1. p. 43. **522**

A. describes a modification of the method of intravenous injection. Intravenous injection by the pressure method (Bobrov apparatus) has a limited application, because it is too rapid and the injected matter may penetrate the surrounding tissues. If a funnel or a syringe without a tube is used, there is a needless wastage of the drug in the connecting rubber tubes, so reducing the dose of the drug injected. To eliminate this wastage, the apparatus is washed with physiological saline so that part of it fills the delivery tube. When the two tubes are connected the physiological solution only is lost.—E. CHERKESI.

POVAZHENKO, I. E. (1943.) Neposredstvennoe perelivanie krovi u loshadeĭ. **[Direct blood transfusion in horses.]**—*Veterinariya, Moscow.* No. 8–9. p. 35. **523**

P. describes a simple method of direct blood transfusion requiring two needles, two lengths of rubber tubing and a glass bulb connecting the two rubber tubes. The total length of the connected tubes is at least 1·2 m., and the needle of the donor a size smaller than that of the receiver. (Diameter of 1·2 mm. and 2 mm. were the sizes used by P.) After sterilization of the apparatus by boiling, liquid paraffin or camphorated oil is run through the tubes.

The donor is placed on a platform 1–1·2 m. above the receiver and the jugular vein is raised by a pad at the base of the neck. The smaller needle with the rubber tube attached is inserted into the vein of the donor and is connected to the needle in the vein of the receiver only when the blood begins to flow freely from it.

The dosage is determined by a preliminary check of the rate of flow of blood through the tubes. 150 ml. per minute was the rate used in P's experiments.

—E. CHERKESI.

PIGOURY, L. (1942.) Récolte aseptique et abondante de sang, chez le lapin, par ponction percutanée de la jugulaire. **[Collection of blood aseptically and in quantity from the rabbit, by percutaneous puncture of the jugular vein.]**—*C.R. Soc. Biol. Paris.* **136.** 774–775. **524**

The percutaneous puncture of the jugular vein is recommended as a better method of withdrawing blood from the rabbit than puncture of the heart or bleeding from an auricular vein. Since the vessel is easily accessible, the procedure is without danger to the rabbit and it is possible to obtain an adequate quantity of blood frequently and aseptically. As much as 25 ml. may be withdrawn every fourth day from a rabbit weighing 2·5 kg. Details of the technique are given.—H. V. H.

REEVE, E. B. (1944.) **Observations on the photo-electric estimation of total haemoglobin.**—*J. Path. Bact.* **56.** 95–107. **525**

The construction and use of a photo-electric photometer for the rapid estimation of total haemoglobin are described. Two methods of estimation are given, one based on alkali haematin and the other on cyanhaemoglobin production, which have been checked for possible sources of error. Values obtained by each method were related to each other and to those obtained by a gasometric method and it is claimed that changes of Hb of about 0·5 g. % can be detected with reasonable care.—A. EDEN.

RYAZANOV. (1943.) Nash sposob operatsii v oblasti glotki i gortani loshadi. **[Method for operating on the pharynx and larynx of horses.]**—*Veterinariya, Moscow.* No. 1. pp. 40–41. 526

R. describes a simple, safe and effective method of gaining surgical access to suppurating foci in the region of the pharynx and larynx and of operating on abscesses and suppurative conditions of lymph nodes behind the larynx.

An incision 5–6 cm. long is made in the lower part of the neck in the mid-line opposite the posterior border of the pharynx. The fascia is cut and the sternohyoid and omohyoid muscles are separated by blunt dissection. The connective tissues adherent to the pharynx are penetrated with the finger up to the level of the larynx, where the gathering abscess will be easily palpated. The abscess is perforated by a light boring movement of the finger. The pus is freely drained through the incision without spreading and the wound heals in 10–12 days. The operation is carried out on a standing horse under a local anaesthetic.

—E. CHERKESI.

YEOMAN, F. (1943.) **Description of Mules operation as done by the new method of holding them in a bundy crush.**—*Yearb. Inst. Insp. Stk N.S.W. 1943.* pp. 61–64. 527

Y. discusses the use of a new method of restraining sheep, particularly adult ewes, while the Mules operation for control of fly-strike is being performed. A description of the construction and technique of use of the crush is given.—H. McL. GORDON.

—. (1944.) Deutsches Reich. Dritte Verordnung des Reichswirtschaftsministers zur Änderung des Mass- und Eichrechts. **[Germany: third regulation concerning changes in standards of measurement.]**—*Reichsgesundheitsblatt.* **19.** 114–115. 528

The order makes slight alterations in the Weights and Measures Orders of 1935 and 1936. The microlitre is defined as 0·001 of a millilitre and the abbreviation "*γl.*" is introduced for it.—W. STROSS.

MISCELLANEOUS

—. (1945.) **Animal diseases ordinance.**—*Palestine Gaz.* No. 1445. Suppl. No. 2. p. 1143. 529

A notification prohibiting the importation from Egypt of cattle, sheep, goats, swine and camels, except under permit obtained prior to importation from the Chief Veterinary Officer.—M. C.

—. (1944.) El Laboratorio de Patología Experimental de la Escuela de Medicina de la Universidad de la Habana. **[Work of the Laboratory of Experimental Pathology, Havana University Medical School, Cuba.]**—*Avancé med.* **5.** 69–71. 530

The Laboratory was founded in 1941 to carry out work of both an experimental and clinical nature; it is now undertaking nutritional studies on the soils and crops of Cuba and the vitamin content of foodstuffs.

The larval form of *Taenia multiceps* is recorded for the first time in Cuba, *Hutia couga*, a wild rodent, being the host. The Najjar-Holt reaction for diagnosis of pellagra in nicotinic acid deficiency conditions is being studied, as are other aspects of nicotinic acid deficiency. Papers published by the Laboratory in 1942 and 1943 are listed.—K. J. SINCLAIR.

—. (1943.) Número em homenagem ao Instituto Vital Brazil. **[Special number dealing with the Vital Brazil Institute.]**—*Biol. med.* **6.** No. 14. pp. 88. 531

This article describes the work of the Vital Brazil Institute, Niteroi, Rio de Janeiro, since its foundation by Dr. Vital Brazil in 1919. The following diseases have been studied, the Institute being responsible for the preparation of vaccines and sera for their prevention and treatment: anthrax, typhoid, diphtheria, bubonic plague, dysentery, tetanus, rabies, foot and mouth disease, swine fever and snake bite. The layout and construction of the building, which includes biological laboratories, library and animal houses, are described.

The publications of the Institute since 1923 are listed. Therapeutic agents and vaccines distributed by the Institute are enumerated.—K. J. SINCLAIR.

—. (Undated.) **National Veterinary Medical Association. Memorandum on hill sheep farming.** pp. 44. London: The Association. 8vo. 532

This memorandum summarizes the views of both the Committee for Scotland and that for England and Wales. Both branches agree that the veterinary services available to British hill sheep farmers could be improved, but that ministerial guidance and help are necessary. A scheme comparable to the existing Survey Scheme for dairy herds is suggested as a possible solution to the present lack of contact between the practitioner and flockmaster. The English branch stresses the desirability of reintroducing large numbers of cattle to hill grazings and makes detailed recommendations for obtaining money to finance programmes of research on hill sheep diseases. Some effort has been made to assess the annual monetary loss due to disease and both branches give a brief description of common sheep diseases.

—G. B. S. HEATH.

HADDOW, J. R. (1940.) **The development of animal husbandry in India.**—*Proc. 27th Indian Sci. Congr. 1940.* **2.** 323–332. 533

H. gives a general survey of the lines on which domestic animals have been developed in India. A wider range of species than in other countries was available, *e.g.*, the elephant, camel, horse, donkey, ox, buffalo and even sheep and goat have all been utilized for transport. As a result there was a tendency to use the species best adapted to a particular environment rather than to select and develop specialized types within a species. Disease and famine in the past were such major factors that the poorer cultivator, although knowing that one good cow and one pair of good bullocks would satisfy his requirements, preferred to own a larger number of animals necessarily of lower quality as an insurance against total loss.

The development of railways and canal irrigation has diminished the menace of famine. Total famine is no longer the constant danger, its place being taken by under-nutrition, the prevention of which depends on improvements in methods of cultivation and utilization of by-products such as molasses to supplement deficient diets.

Means of prevention of loss from the major diseases are now available, but these methods are not utilized to the best advantage. H. considers that the chief reason is lack of sufficient knowledge of the epidemiological factors which govern the incidence of the major diseases, and stresses the need for much further study of this aspect of disease in livestock.

Genetical knowledge can be utilized to the best advantage only when the farmer is reasonably insured against disease and famine. The qualities required from cattle in India are draught and milk production. Fundamental study is required on the possibility or otherwise of combining these qualities in one breed.

Ultimately, improvement of livestock will be conditioned by the general education of the husbandman himself.—M. ABDUSSALAM.

I. BULL, L. B. (1944.) **Research as applied to animal production.**—*Aust. vet. J.* **20.** 233–235. **534**

II. KELLEY, R. B. (1944.) **Research as applied to animal production.**—*Ibid.* 236–238. **535**

These are the opening addresses given to the annual meeting of the Australian Veterinary Association.

I. B. discusses the meaning of the word "research". Research aims at the creation of new ideas and the discovery of new knowledge, as distinct from the mere improvement or perfection of the application of existing knowledge. Research in animal production aims to improve the animal and its product by eradication of disease, improvement in nutrition and selective breeding. Discussions on animal production often ignore the control of disease, but this is the first step in placing animal production on a sound basis. He discusses the significance of animal ecology, physiology (functional and structural), nutrition and dietetics, and genetics and animal breeding. Ecology should be considered not so much a separate branch of study as an approach. The physiology of reproduction is of special importance; the application of genetical knowledge, rather than fundamental research on genetics, is of greatest significance in animal production. Many problems in animal production do not call for actual research but for some ingenuity in the use and application of knowledge gained by research. A national organization is needed to bring together the parties interested in animal production. The formation and work of the Animal Production Committee of the Agricultural Council is the first move in this direction.

II. K. briefly discusses the ecological aspects of the domestication of animals and points out that their environment includes factors unimportant or non-existent in the environment of wild animals. The survival of an animal product depends upon its "economic" environment, *i.e.*, upon its cost of production, its relative importance in the scheme of things and the ease with which substitutes can be found for it. In animals, most quantitative characters of economic importance have polygenic origin and their expression is markedly affected by environmental causes. Domestic animals may be regarded as having characterization that is more or less continuously variable and surroundings that constitute primary and secondary environments. Climate is the chief condition of the primary environment, for it controls types of vegetation and hence nutrition, and also influences the well-being of parasites which may cause disease.

Domestication has altered the primary environment through disease control, protection from predatory animals, etc. All domestic animals in Australia are exotic and as such their national use will depend upon the homologous nature of their present situation and the habitat of their progenitors. If these differ, adaptation to new surroundings depends on modification of the environment, or utilization of inherent genetic variability. Failing this, genetic variability must be increased, *e.g.*, by cross-breeding.

The secondary or economic environment conditions the product which must comply with conditions of trade. Costs of production and residual margins of profit are therefore very important.

The earliest objectives of research in animal production should be to determine characterization and the range of genetic variability of the domestic animals we use, to define and classify the primary environments in which they are maintained in Australia, to state conditions of their secondary or economic environments and to co-ordinate results in assessments of costs of production, thus estimating potential trade and establishing optimal conditions for our animal industries.

—H. McL. GORDON.

KELLEY, R. B. (1943.) **Zebu-cross cattle in Northern Australia. An ecological experiment.**—*Bull. Coun. sci. industr. Res. Aust.* No. 172. pp. 96. **536**

This bulletin should be consulted by all who are interested in the better use of tropical and semi-tropical regions. By way of introduction there are discussions on the ethnological, historical and ecological aspects of the problem and there are descriptions of the tropical types of cattle and of their special characters (heat-regulating mechanism, repellence of ectoparasites, resistance to disease, etc.). A general discussion on hybridization follows, with special reference to work with zebus at the King Estate in Texas, U.S.A., and the history is given of the introduction of zebu cattle into Australia. The rest of the bulletin deals with the results of the hybridization experiments in Australia.

—H. McL. GORDON.

LIDDELL, W. C. (1944.) **Polygamous mating of foxes.**—*Amer. Fur Breed.* **17.** No. 5. 16. **537**

As a result of his own experience, L. formulates several rules for polygamous mating of dog foxes. A dog fox intended for polygamous mating should be penned alone from time of weaning. Females must be brought to his pen for matings and removed immediately after service; a female must not be left with the male overnight, or he will become attached to her and cease to be polygamous. L. recommends a second mating with another polygamous male on the following day, provided that the female will accept service. Where polygamous mating is practised 25 males are usually needed to each 100 females, but in one breeding season L. mated 100 females to only eight males with excellent results.—N. J. SCORGIE.

HENRY, M. (1943.) **Some ideas on rural reconstruction.**—*Aust. vet. J.* **19.** 20–26. **538**

In the newer countries of the world, such as Australia, the necessity for preserving the vitality of the soil has been almost completely immersed in the exploitation of the land to supply overseas markets, without which a sparsely populated country could not have found the wherewithal to continue development. It is pointed out that published figures, usually with a monetary basis, purporting to indicate the relative importance of different industries may be very misleading, for they leave out of consideration the influence of the respective industries on national health and well-being, on the conservation of national assets and on the future of the country.

The basal requirement of Australian agriculture is a change from soil-exhausting to soil-conserving methods. Diversification of farming is necessary, individualism must be replaced by cooperation and community interest, and a better balance established between livestock and plant husbandry.—H. McL. GORDON.

REPORTS

CANADA. (1944.) **Report of the Ontario Veterinary College 1943.** [McGILVRAY, C. D.] pp. 31. Toronto: Printer to the King's Most Excellent Majesty. 8vo. **539**

The B.V.Sc. degree course extends over five years. Toronto University matriculation standards are applied to students. Graduate courses for the degrees of M.V.Sc., D.V.Sc. and the Diploma in Veterinary Public

Health (D.V.P.H.) are also available. Special courses in public health for senior students, on fox farming for fur breeders, and refresher courses for veterinarians are also held. A clinical service for veterinarians and livestock owners is available.

Work on BOVINE CONTAGIOUS ABORTION in co-operation with veterinary practitioners and livestock owners has been further expanded. Of the 8,941 dairy cattle tested before export, less than 4% gave a positive reaction and 3·64% were doubtful. In the routine testing of individual herds 218,804 blood samples were tested, 14% being positive and 5% doubtful. There are ten prescribed areas in which 577 herds (12,255 cattle) were tested by registered veterinarians paid by the Department. Under this scheme 32,119 tests were made; 3% were positive and 4% doubtful.

Calf vaccination is being practised in 2,825 herds under supervision of the College. 34,650 calves 4–8 months of age were given live vaccine, prepared from Cotton's no. 19 strain of *Brucella abortus*, by veterinary practitioners. These calves were check-tested after 30 days and slightly over 95% showed a positive reaction and less than 5% were negative or doubtful. These calves were revaccinated.

The Poultry Laboratory Service dealt with 3,604 specimens and the results are tabulated. PULLORUM DISEASE was diagnosed in 1,369 specimens and COCCIDIOSIS in 611.

DEATH DUE TO ANAPHYLAXIS FOLLOWING THE INTRAVENOUS INOCULATION OF BRUCELLA ABORTUS STRAIN 19. [SCHOFIELD, F. W.]—Two cases (one fatal) are described. The same batch of vaccine given subcutaneously to over 50 calves had no ill effect.

AN ANAEROBIC STREPTOCOCCUS ISOLATED FROM CASES OF BOVINE MASTITIS. [SCHOFIELD, F. W.]—An anaerobe is described which does not correspond culturally with any strains of streptococci commonly found in mastitis milk.

SALMONELLA PULLORUM INFECTION IN MATURE TURKEYS. [GLOVER, J. S.]—The organism has been isolated this year from adult turkeys for the first time.

[REPORT OF THE] CLINICAL DEPARTMENT. [MCINTOSH, R. A.]—The general scope of the Department's activities is summarized. Diseases more extensively dealt with are SWINE ERYSIPELAS, COCCIDIOSIS and COBALT DEFICIENCY in young cattle, VITAMIN B DEFICIENCY in young pigs, LEAD POISONING in cattle and HYDROGEN SULPHIDE POISONING after feeding sulphur with silage to young cattle.

REPORT OF THE PROVINCIAL ZOOLOGIST. [STEVENSON, L.]—The work covered is summarized. The diseases of fur-bearing animals are dealt with: losses were greatest from FOOD TOXAEMIA; losses from DISTEMPER were limited to ranches which were near towns and exposed to infection from dogs. PARASITIC INFESTATION is said to be limited to a great extent to foxes and rabbits on ranches where wire floors are not used.—J. A. GRIFFITHS.

I. AUSTRALIA. (1942.) **Sixth annual report of the Australian Wool Board for year 1941–42.** pp. 20. Melbourne. 4to. **540**

II. AUSTRALIA. (1943.) **Seventh annual report of the Australian Wool Board for year 1942–43.** pp. 20. Melbourne. 4to. **541**

I. The work of the International Wool Secretariat on wool production, publicity, education and economic and technical research is briefly described. Investigations on pastoral research are given in greater detail, the information being presented for the use of wool growers.

The report has some information on investigations of pasture plants under a wide variety of conditions in several states of Australia.

II. Various aspects of pastoral research carried out by the Council for Scientific and Industrial Research and described in the 17th Annual Report of the Council for 1942–1943 are here presented in somewhat greater detail and for the grazier. The effects of the Mules operation and the longer tail on the control of FLY STRIKE are presented in the form of percentage of sheep struck during various periods of the year. There is brief mention of fly-dressings and chemical analyses of fleece from sheep of known susceptibility to fly strike. Lime-sulphur dips have proved effective in controlling the skin mite (*Psorergates ovis*) of sheep.

Doses of 40 g. of phenothiazine were completely successful in removing *Oesophagostomum columbianum* from sheep. The usual dose of 20 g. is not always 100% efficient. Storage of phenothiazine suspensions for eight months did not impair their anthelmintic properties. Experiments were carried out on the efficiency against *Haemonchus contortus* of sodium arsenite, arsenic pentoxide and copper aceto-arsenite, and tablets containing copper sulphate and sodium arsenite. The tablets were ineffective. Emulsification of carbon tetrachloride did not impair its efficiency. Oil of turpentine in a salt lick was ineffective.

Observations on TOXAEMIC JAUNDICE showed that natural outbreaks were frequently associated with seasonal stresses causing a falling plane of nutrition. The disease is characterized by a fairly sudden onset of haemoglobinaemia followed by haemoglobinuria and jaundice. Before the development of these clinical signs, an increase in the blood copper values to about ten times the normal appeared and was associated with the presence in the sheep of an abnormal storage of copper in the liver. The investigations were complicated by the occurrence of cases of a true haemolytic jaundice in the experimental flock.

A sudden and severe check in food supply in a flock of 500 merino ewes in good condition close to lambing precipitated about 90 cases of PREGNANCY TOXAEMIA. The majority of affected ewes were carrying either twins or triplets, and were in the last week of pregnancy. Sheep on cereal diets have shown a tendency to form URINARY CALCULI. A high magnesium content of the urine appears to be a contributing factor. Field experiments have shown that a high proportion of cases of PIZZLE ROT (BALANITIS) in wethers was cured by keeping the sheep under fasting conditions for several days.

An illustrated booklet for sheepowners has been prepared dealing with fertility of rams and ewes, including a description of a method of forecasting fertility of rams from local weather records.

In a field trial at Gilruth Plains the seasonal variations in nutritive value of the pastures have been estimated in the final terms of wool production. The importance of the plants associated with Mitchell grass (*Astrebla* spp.) and growing under seasonal conditions when the grass is dormant has shown itself in the increase in fibre diameter and total weight of wool produced under specified seasonal conditions.

In studies on drought feeding, the amount of wool produced was found to bear a well defined relationship to the nutritional level and to increase five times between submaintenance and the optimum nutritional conditions. The rapid increase in wool production at levels above maintenance suggests that during feeding in prolonged drought it will be more economical to feed slightly in excess of bare maintenance. Investigations showed that VITAMIN A DEFICIENCY is not likely to limit appreciably the general health of sheep until they have been subject

to dry feeding for more than six months. About one-third of an ounce of dehydrated lucerne provides the daily vitamin A requirements of a sheep. Investigation of the effect of addition of urea to protein-deficient rations, composed chiefly of roughage in which cellulose was the main source of energy, indicated that wool production was not increased. There were indications, however, that the results may be quite different if the diet contains starchy constituents. It was shown that sheep can be maintained just as well if fed once a week; they utilized the feed almost as efficiently as sheep fed daily with one seventh of the weekly ration. (The ration used was equal parts of lucerne chaff and wheat, fed at 0·85 lb. per head per day to wethers weighing 77 lb. The ration was increased in the winter.)

Work on supplementing cereal rations with calcium was continued. Lambs weaned on to a ration of wheaten chaff 44 parts, oats 25, bran 25, linseed meal 5 and sodium chloride 1 suffered 100% mortality, often within 3–6 months. Weaners and adult sheep on the ration became severely hypocalcaemic. Serum magnesium and inorganic phosphorus were increased considerably. Dental development was grossly affected. Appetite was depressed within 2–3 months. By supplementing the ration with 1% calcium carbonate all these abnormalities were prevented. Slaked lime is not a satisfactory substitute for finely ground limestone. Fine grinding is essential for efficient utilization.

In work on establishing methods for the biological analysis of the fleece, observations were made on rate of production of dry wool per unit area of skin, rate of growth in fibre and staple length, rate of crimp formation, rate of production of wax and suint, variation in fibre thickness, fibre and follicle population density, variation in skin wrinkles, variation in body weight, and daily food intake.

Progeny testing with sheep was continued. The characters evaluated were body weight, raw fleece weight, yield percentage, clean-scoured fleece weight, staple length and approximate fibre uniformity. Progeny were also graded for degree of skin fold development. Studies on fleece density showed fibre populations varying from 14,000 to over 90,000 per square inch. The ratio of primary follicles to the total follicle population was found to be 1 : 6 to 1 : 37.

Investigations on tenderness and break in wool showed that insufficient protein during summer and autumn was chiefly responsible. It was observed that strong-woolled types of merino sheep do not necessarily grow more wool than medium-woolled types when both are grazing under the same conditions. Sheep on fairly poor pasture need ½ lb. cereal grain (wheat) or more per head per day and pregnant and lactating ewes 1 lb. per head per day or more to meet their needs for energy. To maintain a good growth of wool, sheep need, in addition, at least 3 oz. protein per head per day.

An outbreak of clinical HYPOCALCAEMIA in ewes grazing on pig-weed (*Portulacca* spp.) led to an investigation of the oxalate content of the plants. The proportion of the total oxalate present as water-soluble salts was 41·4–82·6% of the total.

Other research projects discussed include studies on the hairy fibres in Australian wools, the management of seeded pastures (with special reference to phalaris, subterranean clover and Wimmera rye-grass), investigations on the effects of mineral deficiencies in soil, grazing of bluebush-shrub pasture, management of spinifex (*Triodia pungens*), general studies on pastures in various states, special grazing trials on Mitchell grass pastures in South-Western Queensland and sown pastures at Canberra.—H. McL. GORDON.

AUSTRALIA, NEW SOUTH WALES. (1944.) **Livestock Disease Report, 1943-44, Division of Animal Industry, Department of Agriculture.** [HENRY, M.] pp. 7. fcp. [Typescript.] 542

The number and nature of specimens undertaken for diagnostic work at the veterinary research station at Glenfield is briefly discussed. There was a big increase in poultry material.

In work on BOVINE MASTITIS a number of drugs were tested by udder infusion; these included acriflavine, sulphanilamide, "monacrin" (an acridine derivative), "phemerol" and iodized mineral oil. Sulphanilamide in maize oil appeared to be promising; "monacrin" was very effective but is expensive; "phemerol" and iodized mineral oil were effective, though irritant.

The number and distribution of outbreaks of ANTHRAX among sheep, pigs, cattle and horses are given, together with the number of animals quarantined and the deaths recorded. Work in connexion with TUBERCULOSIS was extensive and the Tubercle-free Herd Scheme most successful. 28,489 tests were applied to cattle supplying raw milk to Sydney and Newcastle and 1·09% reactors were found. Although a proportion of these were dealers' cattle, before their introduction to the herds, this result is not satisfactory. Few cases of SWINE ERYSIPELAS were reported during the year.

Vaccination against BRUCELLOSIS of cattle with Strain 19 failed to give results comparable with those reported by Cotton and Buck in the U.S.A. PORCINE BRUCELLOSIS is discussed briefly.

The distribution and number of outbreaks of BOVINE CONTAGIOUS PLEURO-PNEUMONIA, the number of cattle quarantined and the number of deaths are listed.

ENCEPHALITIS in horses seemed in one area to be associated with repeated arsenical dipping. Only ten specimens were received for diagnosis of SWINE FEVER and all were negative. In research on the disease, the virus was kept viable for 366 days in frozen pork. In bacon it was viable 27 days after the pig was killed and immediately after smoking. In pig houses free of sunlight pigs introduced 24 hours after sick pigs had been removed became infected, but pigs introduced after an interval of 48 hours did not become infected. Breeding sows are to be vaccinated against SWINE POX in an attempt to give temporary immunity to suckling pigs.

Comments are made on the southern extensions of the buffalo fly (*Lyperosia exigua*) in Queensland and the potential dangers of the fly entering New South Wales. The stickfast flea (*Echidnophaga gallinacea*) is present in southern Queensland and has been introduced into New South Wales (at Broken Hill) from South Australia.

The term of compulsory dipping against CATTLE TICK INFESTATION in the Grafton-Maclean area was completed and the period of routine inspections begun. Officers have been transferred, as a preliminary to eradication of ticks, to a further section of the infested region of north-eastern New South Wales. Little further work has been undertaken on MITE INFESTATION of sheep. In an effort to reduce losses from SHEEP BLOWFLY, studies on the breeding of a plain-breeched type of merino have been continued.

Preliminary work is in hand on the artificial insemination of cattle.

Two disease entities causing fatal TOXAEMIC JAUNDICE appeared in sheep in the experimental flock.

The animals imported and exported by sea and transferred across the State border are enumerated. The number of pigs slaughtered and condemned for TUBERCULOSIS at various abattoirs averaged 1·53%. The numbers of livestock in New South Wales on the

31st March, 1944, were as follows: 465,672 horses, 3,143,378 cattle, 56,837,300 sheep, 561,294 pigs.
—H. McL. Gordon.

New Zealand. (1944.) **Department of Scientific and Industrial Research (eighteenth annual report of the). [1943-44.]** pp. 57. Items of veterinary interest pp. 8, 19, 25, 40 & 41. Wellington: Govt. Printer. 1s. 3d. **543**

Research projects on animal production problems included studies on Abortion and Mastitis in cows, the progeny test in sheep, the carcass quality of fat lambs, teeth of sheep, the development of an inbred strain of Romney sheep and pig-breeding experiments. In projects on dairy cow nutrition conducted at the Dairy Research Institute, study was made of the effects on the health of the animals and on the yield and composition of milk of maintaining cattle on different types of pasture. The influence on the production and composition of milk of the addition of meal to the normal farm ration of dairy cattle was also observed. In studies on milk secretion in dairy cattle, the effects of diethylstilboestrol and other hormones in artificially inducing lactation were investigated. Investigations on poisonous plants embraced studies with pigeonwood, tawa, akakiore and kohuhu. At Nelson, investigations were conducted to determine the effectiveness of applications of varying qualities of cobalt sulphate in the control of Bush Sickness. In studies of sheep dipping, the effect of derris dip on lice-infested sheep was investigated.
—M. B. Buddle.

Gold Coast Colony. (1944.) **Report of the Department of Agriculture for the year 1943-44.** pp. 10. Accra: Govt. Printing Department (Publications Branch); London: Crown Agents for the Colonies. fcp. 1s. Items of veterinary interest pp. 2–3. **544**

Good results are claimed in the fattening of pigs in fly-proof houses of the Scandinavian type. About 100 pigs were kept in each house and methods of management differed little from those used in Europe. The houses were fly-proofed to exclude tsetse flies.
—M. C.

Jamaica. (1945.) **Annual report of the Department of Agriculture for the year ended 31st March, 1944.** pp. 16. Items of veterinary interest p. 12. Kingston: Govt. Printer. fcp. **545**

28% of the cattle at the Hope Agricultural Station were positive reactors to the agglutination test for Bovine Contagious Abortion. Many cases of Anaplasmosis occurred at the Hope Farm following the purchase of outside fodder. On account of insufficient fodder supplies, it was necessary to effect drastic reduction of the numbers of stock on the farm. 359 animals were sold or transferred to other stations. Preventive vaccination against Anthrax, Blackleg and Swine Fever was continued, some 9,000 animals being dealt with. No positive cases of Anthrax occurred. Tick Fevers are increasing as a result of the difficulty of obtaining supplies of dipping materials, the unsuitability of some dipping tanks and the lack of interest on the part of the cattle owners. Shortage of staff prevented the undertaking of new work such as tick fever surveys and control of Helminthiasis. Fifty livestock centres were in operation and altogether 12,068 stud services by donkeys, bulls, goats, sheep and boars were carried out; in addition 1,968 services were given by subsidized sires. The work with livestock at various agricultural centres is briefly described. Tamworth pigs have proved to be fairly hardy but are not liked by the local breeders. 1,400 day-old chicks were imported from the U.S.A. Pedigree cattle and goats were imported from Canada, the U.S.A. and Cayman.—M. C.

I. U.S.A., Michigan. (1941.) **Report of the Division of Veterinary Science, Michigan State College of Agriculture and Applied Science, East Lansing, 19[40-]41.** [Giltner, W.] pp. 59. East Lansing, Mich. 8vo. **546**

II. U.S.A., Michigan. **Report of the Division of Veterinary Science, Michigan State College of Agriculture and Applied Science, East Lansing, 19[41-]42.** [Giltner, W.] pp. 79. East Lansing, Mich. 8vo. **547**

I. There were 297 students enrolled in 1940–41. The authorized additions and alterations to the veterinary hospital were completed.

[Report of] Department of Animal Pathology [Hallman, E. T.]—The results of 652 P.M. examinations of animals and the diagnoses made of 9,136 specimens of animal tissues are described.

[Report of] Department of Surgery and Medicine [Giltner, W., & Hutton, J. P.]—A summary is given of the 11,184 cases treated, 3,473 in the hospital and 7,711 by the ambulatory clinic. These included 1,189 horses, 4,919 cattle, 898 pigs, 578 sheep and goats, 2,885 dogs, 321 cats and 394 fur-bearing animals.

[Report of] Extension Specialist in Animal Pathology [Killham, B. J.]—Brucellosis control work was limited by the inadequate funds available to pay indemnity for animals slaughtered. All the cattle of 40 northern counties had been tested and the reactors slaughtered. In only 14 of these counties was infection 1·0% or less, so that there was enormous scope for the use of larger sums for indemnity money in clearing the state of this disease. Blood tests had been made of 1,799,370 cattle since the campaign started in July 1934 in Michigan. The subject of vaccination had been receiving much attention, but the tendency had been to consider it a less expensive means of control without there being justification, on the facts as then known, for its use. Every effort was being made to confine vaccination to young calves. Milk samples tested for Mastitis in 1940 showed 41·4% positive or suspicious. There were no outbreaks of Equine Encephalomyelitis. A widespread outbreak of Rabies resulted in 47 southern Michigan counties being placed in quarantine. Swine Fever was more prevalent than in several previous years. About 10% of an estimated total of 384,000 horses in the State received treatment for parasites. Some of the difficulties encountered in Artificial Insemination are mentioned.

[Report of] Extension Specialist in Poultry Pathology (1940) [Weisner, E. S.]—Poultry raising was the second largest agricultural industry. There were approximately 11 million adult birds. During the year, 6,341 birds were received for diagnosis at the laboratory. The spiral stomach worm, *Acuaria spiralis*, was found in the gizzard and proventriculus of four pullets. The northern fowl mite, *Liponyssus sylviarum*, was found on birds from six counties. Deficiency diseases appeared to be a common cause of losses. Exposure of chicks to formaldehyde gas at hatching is recommended by hatcheries for the prevention of Pullorum Disease.

Section of Bacteriology [Huddleson, I. F.]—Further studies were carried out on active immunization against *Brucella abortus*, *Br. suis*, and *Br. melitensis* by the use of the water-soluble fraction obtained by crushing brucella cells in a special type of mill; g. pigs and 600 cattle were used. The study of the biology and biochemistry of brucella has shown a method of determining the virulence of species of *Brucella*, based on the catalase activity of a standard suspension of live organisms, a test which can be com-

pleted in 30 min. Each species has a zone of activity and the more virulent cultures have a higher activity within the zone. Extremely virulent cultures of *Br. abortus* and *Br. melitensis* overlap. Other studies in progress are mentioned.

POULTRY DISEASES AND PUBLIC HEALTH BACTERIOLOGY [STAFSETH, H. J.]—Routine work and studies in progress are reviewed. A summary of 6,341 P.M. examinations of birds is given.

MASTITIS OF CATTLE [BRYAN, C. S.]—Details are given of bacteriological work in progress.

PARASITOLOGY [HAWKINS, P. H.]—A summary is given of 31 species of parasites found in 1,029 domestic animals.

II. Sixty-four first-year students started on an accelerated programme of studies which would allow them, as a war measure, to graduate at the end of three years. Two hundred and ninety-eight veterinary students were enrolled.

[REPORT OF THE] DEPARTMENT OF ANIMAL PATHOLOGY. [HALLMAN, E. T.]—Details are given in tables of the results of 631 autopsies and the examination of 3,284 specimens from 1,989 clinical cases; and 2,602 specimens were examined in the course of meat inspection.

[REPORT OF THE] DEPARTMENT OF BACTERIOLOGY AND HYGIENE. [GILTNER, W.]—A new course in Veterinary Hygiene has been added to the curriculum.

[REPORT OF THE] DEPARTMENT OF SURGERY AND MEDICINE. [HUTTON, J. P.]—A table gives details of 12,685 cases treated. Of these 3,881 were hospital cases and the others were dealt with by the ambulatory clinic. They included 1,428 horses, 6,237 cattle, 1,116 pigs, 3,400 dogs, 196 cats and 87 foxes.

ANNUAL REPORT, 1941, EXTENSION SPECIALIST—ANIMAL PATHOLOGY. [KILLHAM, B. J.]—MASTITIS ranks next in importance to BOVINE CONTAGIOUS ABORTION as a problem for dairy farmers. Laboratory reports show that 36·4% of samples of milk show streptococcal infection.

Bovine contagious abortion control methods are undergoing a change owing to the inadequacy of funds to pay indemnities. The system of vaccination is not entirely satisfactory. Despite recommendations regarding its use, mature cattle are being vaccinated. In the seven years ending June, 1941, tests of 1,459,841 cattle showed 4·1% infected. Tests of 14,000 herds by local veterinarians showed that 5% of these herds had 20% or more cattle infected.

A minor outbreak occurred of EQUINE ENCEPHALOMYELITIS. No data are available.

Owing to the declining interest in the horse the subject of horse parasite control has no longer the same importance for the majority of farmers. The census shows a 10% decline in the number of horses. Phenothiazine is used in the control of nodular worms in sheep but is not used for other parasites; its cost makes its use prohibitive in competition with copper and nicotine sulphate.

The value of cobalt was demonstrated as an addition to the ration of cattle with the deficiency disease known in Michigan as GRAND TRAVERSE OR SHORE DISEASE. This application resulted from research reports from Australia, New Zealand and Florida.

Demonstrations were given of the use of irradiated yeast (vitamin D) as a means of preventing MILK FEVER in cows.

ANNUAL REPORT, 1941, EXTENSION SPECIALIST IN POULTRY PATHOLOGY. [WEISNER, E. S.]—The work carried out is detailed. A paper on COCCIDIOSIS of rabbits emphasizes the value of iodine as a disinfectant in the control of the disease.

STUDIES IN BRUCELLA INFECTIONS. [HUDDLESON, I. F.]—In studies on immunization a water-soluble agent recovered from a suspension of live *Br. abortus* and *Br. suis* crushed in a bacterial crushing mill was found to induce immunity to brucellosis. The results show that it is not necessary to inject live brucella organisms to produce an immunity. 20 mg. of the fraction was shown to protect animals. Other studies on brucella and brucellosis are detailed.

The research work undertaken on MASTITIS of cattle and dairy hygiene, poultry diseases, public health bacteriology, and parasitology is summarized.—J. A. G.

BOOK REVIEWS

HOWELL, A. B. (1944.) **Speed in animals, their specialization for running and leaping.** pp. xii+270. 55 figs. Chicago: University of Chicago Press. 8vo. $4.00. **548**

The necessity of acquiring speed has been the greatest single factor in the progressive evolution of animal form. With this theme in mind, H. introduces the book by surveying the general changes that have taken place in many types of vertebrates—from fish to placental mammals—in adapting themselves to speedy locomotion. The emphasis throughout is not on shape alone but on form closely correlated with function.

The complex muscular groups, which, acting in unison, promote effective body movements, are naturally subjected to great variations. Many excellent examples are given of their functional modification. Coupled with this is the arrangement of skeletal forms; among features dealt with one may select for special commendation the sections dealing with the phylo-genesis of the pectoral or shoulder girdle and the relative changes in bone lengths. The very important part which ligaments play in co-ordinating the activity of these two systems has not been overlooked, although perhaps more might have been said of the ligaments themselves.

Of particular value to those interested in the horse will be the chapters dealing with proportions and gaits.

This book should be of interest to biologists and to all those appreciative of the beauty and art of animal movement. A possible criticism is that too many genera have been considered, but the book should be regarded as a compendium rather than a detailed description of selected types.—C. W. OTTAWAY.

HUBBARD, C. L. B. (1945.) **The observer's book of dogs.** pp. 224. 148 figs. London & New York: Frederick Warne & Co. Ltd. 8vo. 4s. **549**

This small volume describes briefly 300 varieties of dogs and illustrates 148 of them with photographs.

The descriptions are not intended for the expert dog fancier but will enable the general reader to recognize the various types. There are notes on the origin of the different breeds, covering wild as well as domestic dogs. The notes on wild dogs and breeds from the more remote parts of the world are necessarily very short and in some cases likely to rouse controversy. The Ceylon wild dog is, for example, one which dog breeders in Ceylon do not recognize. A short section dealing with feeding, management and illnesses attaches rather too much importance to worms as a cause of ill-health. The illustrations are good and the presentation very pleasing.—M. C.

See also abstr. **464** (annual review of biochemistry), **466** (semen of animals and its use for artificial insemination).

4539—Wt.P.3—Dd.208—4/46—H. R. G. Ltd.—G.13.

INDEX VETERINARIUS

The publication of *Index Veterinarius* commenced with the indexing of the literature of 1933. It is a complete index of current publications relating to veterinary research, public health, administration, education and other aspects of veterinary science.

The latest list of the publications indexed for this purpose was included in *Index Veterinarius*, Vol. 6. No. 1 (issued December, 1938) and also circulated with the *Veterinary Bulletin*, Vol. 9, No. 1.

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